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DISEASES CAUSED BY BACTERIA AND FUNGI

Mondini, S., Dovadola, E. (1959). Tipizzazione fagica di ceppi di stafilococco isolati da polli, da farine di carne e di pesce e da mastiti actinogranulomatose bovine. **[Phage typing of staphylococci isolated from fowls, meat meal, fish meal and bovine mastitis.]**—Zooprofilassi **14**, 755-764. [Summaries in English and French.] **1675**

Of 76 strains of staphylococci from fowls 29 were lysed by phage 47C; 2 by 42B, 2 by 47B, 2 by 51 and the remaining 36 were resistant to all of 35 phages used; of 15 strains from bovine mastitis 5 were lysed by phage 47C, 5 by 47C and 42D, and one by 47. The remaining 4 and 52 other strains from meat- and fish meals were phage-resistant.

—T.E.G.R.

Hoeprich, P. D., Croft, G. F., West, L. M. (1960). **Tellurite reduction as an indicator of potentially pathogenic staphylococci.**—J. Lab. clin. Med. **55**, 120-128. [Authors' summary modified.] **1676**

Tellurite reduction, as determined by using a tellurite–glycine agar medium, is recommended for laboratory determination of potential pathogenicity.

It gave the same results as plasma coagulation (tube coagulase test). The test offers the additional advantage of economy of time and materials.

Anon. (1959). **Great Britain. Ministry of Labour. Report of the Committee of Inquiry on Anthrax.**—pp. 222. London: H.M. Stat. Off. 12s. **1677**

This report reviews all aspects of the problem of the risk and occurrence of anthrax in industries using imported wool, hair, hides and skins, and bones and bone meal, and in the transportation of these materials, all cases known to have occurred outside the scope of the Factories Acts, the legal requirements that have been imposed, and the precautions taken to minimize the risks. During the past 50 years, the incidence in man of external anthrax in Gt. Britain has fallen to about 20–30 cases a year; this decline seems to be due to better hygiene in factories and by employees themselves rather than to any decrease in the infectivity of imported materials. Deaths from external anthrax have declined even more markedly to about one a year as a result of improved medical diagnosis and treatment. Internal anthrax, though now very rare, is still almost always fatal. The committee does not consider that the current legal regulations require appreciable alteration although some modifications should be made with regard to the prohibited importation and compulsory disinfection of certain wools and hair (drawn goat hair, dehaired China Cashmere, Cashmere yarns, mohair and Egyptian wool). Its chief recommendations concern the establishment of procedures for the prompt reference of all suspected cases for expert medical advice, the extension of precautions of general application to all places where anthrax-bearing materials are handled, and the statutory notification of anthrax under the Public Health Act as well as under the Factories Acts. This last recommendation will enable the extent of the risk occurring outside the scope of the Factories Acts amongst agricultural and horticultural employees and private gardeners as a result of handling bone meal to be assessed.

—A. Ackroyd.

Cherry, W. B., Freeman, E. M. (1959). **Staining bacterial smears with fluorescent antibody. V. The rapid identification of Bacillus anthracis in culture and in human and murine tissues.**—Zbl. Bakt. I. (Orig.) **175**, 582-604. [In English. Summaries in French, German, Spanish and Russian.] **1678**

The globulin fraction of immune serum

against capsulated *B. anthracis* was labelled with fluorescein isocyanate and was used to stain cultures, impression smears and sections of tissue. It was not completely specific because some strains of *B. cereus* and *B. megatherium* took up the stain, but used judiciously it gave valuable information, and the whole procedure took only an hour.—R.M.

Hausmann, W. (1960). Kann die Tuberkulinisierung Aborte und Tierverluste verursachen? **[Can tuberculin testing cause abortion and livestock losses?]**—Prakt. Tierarzt No. 2. pp. 35-36. **1679**

In Bavaria from 1957 to 1959, 567 cows aborted within about 9 days of a tuberculin test (about one in every 7,000), and 131 cattle of all ages died or had to be slaughtered (one in every 88,000). The most frequent causes of losses were broken bones and injuries, sequelae of abortion, and allergic conditions. Of the cows which aborted, 96 were positive and 463 negative to tuberculin. 480 were over 5 months pregnant.—M.G.G.

Scholz, J. (1959). Infektion eines Rinderbestandes durch einen Menschen mit extrapulmonaler Tuberkulose. **[Infection of a herd of cattle by a person with extrapulmonary tuberculosis.]**—Rindertuberk. u. Brucellose **8,** 204-207. **1680**

Positive tuberculin reactions in 5 cows in an attested herd were attributed to infection from an unhealed operation wound in the arm of a milker from whom a tuberculous hygroma had been removed. In subsequent tuberculin tests the reactions were typical of infection with the human type [*V.B.* **29,** 3704]. All cows were negative after 7 months.—M.G.G.

Coletsos, P. J. (1959). Étude des facteurs intrinsèques de Mycobacterium tuberculosis expliquant l'état de quiescence et les échecs de culture sur milieux usuels. **[Intrinsic factors of tubercle bacilli which account for the quiescent state and failure to grow on ordinary media.]**—Ann. Inst. Pasteur **97,** 290-306. [Summary in English.] **1681**

Survival and persistence of *M. tuberculosis* during antibiotic therapy is due not only to resistant strains but also to the presence of "sensitive persistent" elements, and of other elements in a "quiescent state". "Sensitive persistent" elements and, therefore, "quiescent bacilli" are demonstrable *in vitro* only in the presence of organic stimulating substances closely resembling those in the human body. Extracts from monkey organs have an almost specific stimulating effect on such bacilli. This might account for relapses and persistence of active lesions in patients excreting apparently non-viable bacilli and would confirm the hypothesis that bacilli find in the human body conditions (not found in routine culture media or in g.pigs) essential to their development. These findings might explain the easy spread of the bacilli from man to man and it would appear that antibacterial drugs cause an involution of the bacilli bringing them closer to Hansen's bacillus.

—T.E.G.R.

Burtin, P. (1959). Recherches immunochimiques sur les antigènes solubles du bacille tuberculeux. II. Étude immunochimique de deux polysaccharides présents dans les filtrats de culture du bacille tuberculeux. **[Immunochemical studies on soluble antigens of tubercle bacilli. II. Polysaccharides in filtrates of cultures.]**—Ann. Inst. Pasteur **97,** 325-339. [Summary in English.] **1682**

An immunochemical relationship was observed between polysaccharides I and III of tubercle bacilli. Immune serum may be absorbed by only one of the polysaccharides; it may be absorbed totally by one and partially by the other, or partially by each. These reactions depend on the chemical composition of the serum. The relationship is attributed to partial identity in the composition of the polysaccharides—the molecule of each contains mannose and arabinose: these sugars were responsible, at least in part, for cross reactions.—T.E.G.R.

Rice, C. E., Annau, E., Konst, H. (1959). **Studies on Johne's disease in Canada. VII. Complement-fixation tests with a polysaccharide fraction of Johne's bacilli.**—Canad. J. comp. Med. **23,** 291-295. **1683**

Polysaccharide fractions were isolated by phenol extraction of unheated Johne's bacilli disintegrated by sonic vibration and then precipitated by an alcohol-ether method. These fractions, found to be highly reactive serologically, reacted similarly with antisera prepared against Johne's bacilli and avian tubercle bacilli. While specificity of the serological tests was not increased with use of the polysaccharide antigens, there was some evidence of more sensitivity than the bacterial suspensions in the detection of antibodies present during the later stages of immunization or infection with Johne's bacilli.

—R. V. L. Walker.

Rice, C. E., Konst, H. (1959). **Studies of Johne's disease in Canada. IX. Comparison of complement-fixation titres prior to and at 24 or 48 hours after a johnin intradermal test.**—Canad. J. comp. Med. **23**, 369-374. [Authors' summary modified.] **1684**

Because there are certain practical advantages in collecting blood specimens from cattle when the johnin test is read rather than before the test, an investigation was made in sensitized g.pigs and cattle to determine whether johnin injection produces any fall in c.f. titres of the serum with Johne's bacillus antigens. Comparative titrations of sera from blood collected before and 48 or 72 hours after the i/d inj. of P.P.D. johnin revealed no significant change in reactivity with Johne's bacillary suspension, carbohydrate or protein antigens. Normal g.pigs and cattle similarly treated, showed no tendency to develop non-specific c.f. activities with these antigens.

Erlich, H. (1960). **Rapid identification of mycobacterial colonies. I. The auramine test.**—Amer. Rev. respir. Dis. **81**, 218-225. [Author's summary modified.] **1685**

A new reagent, alkaline auramine, differentially stains mycobacterial colonies brilliant yellow.

59 strains of atypical mycobacteria and 43 strains of *M. tuberculosis* were tested by three auramine techniques: the disk test, the flood test, and the fluorescence test.

The results with the auramine disk and flood tests appeared to parallel the neutral red reaction by the microcolonial method.

Hart, P. D'A., Valentine, R. C. (1960). **Elongation of a leprosy bacillus (Mycobacterium lepraemurium) in a cell-free medium.**—Nature, Lond. **185**, 58-60. **1686**

Growth of *M. leprae* was attempted on 3 non-nutrient media and on 3 nutrient media the basis of which consisted of: Difco 2·5 g.; potassium dihydrogen phosphate, 1 g.; anhydrous disodium hydrogen phosphate, 2·5 g.; potassium dihydrogen phosphate, 1 g. sodium citrate, 1·5 g.; crystalline magnesium sulphate, 0·6 g.; glycerol, 25 ml.; distilled water to a litre; to this was added bovine plasma albumin (fraction V) to make 0·25%. In the 3 non-nutrient media elongation did not occur and degeneration was rapid. In the basal medium plus 10% sucrose or 8% glucose the mean length nearly doubled and the proportion of bacilli longer than 2·5 μ rose from 6 to 67% (sucrose) and to 51% (glucose) in 1 month and degeneration was delayed. Failure of the rat leprosy bacillus to multiply in culture is attributed to failure of the bacillus to divide rather than to its inability to metabolize and grow.—T.E.G.R.

Baumann, R., Jaksch, W. (1959). Infektionsversuche mit Mycobacterium suis bei Pferd und Hund. [**Experimental infection of horses and dogs with "Mycobacterium suis", the organism of caseous lymphadenitis in pigs.**] —Wien. tierärztl. Mschr. **46**, 431-441. [Summaries in English, French and Italian.] **1687**

A stallion and a mare were inoculated s/c with saline suspension of cultures of the acid-fast organism isolated from pigs by Baumann and others [*V.B.* **26,** 714 & 3685] and named *"Mycobact. suis"* by them. There were no significant symptoms apart from oedema, abscess and necrosis at the site of injection, but the animals developed allergy to tuberculin. Two dogs resisted experimental infection.

—E.G.

Anon. (1959). **Mycobacterial tuberculin sensitivity.**—Lancet February 28th, 456-457. **1688**

A short review indicating the necessity of finding more precise terminology for conditions resulting in mycobacterial tuberculin sensitivity not due to infection by *Mycobacterium tuberculosis,* than "non-specific" or "non-tuberculous" sensitivity. Reference is made to the use of comparative tests to diagnose disease caused in man by the photochromogenic and the non-photochromogenic mycobacteria.—W. E. Parish.

Anon. (1959). **Mycobacterial pseudotuberculosis.**—Lancet June 20th, 1266. **1689**

A short review of disease in man simulating tuberculosis but apparently caused by "atypical" mycobacteria. The necessity of accurately differentiating these organisms from tubercle bacilli is stressed and references are given to the positive reaction for arylsulphatase and the negative reaction for niacin.

—W. E. Parish.

Kucsera, G. (1959). Sertésorbánc elleni csapadékos vakcina értékmérése sertésen, a fertőzés intradermalis titrálásával. [**Evaluation of precipitated swine erysipelas vaccine by intradermal titration in pigs.**]—Mag. állator. Lapja **14**, 279-282. [In Hungarian. Summaries in English and Russian.] **1690**

Evaluation of 31 precipitated swine erysipelas killed vaccines was carried out in pigs weighing 25–30 kg. challenged with a standard virulent strain of *E. rhusiopathiae* injected i/d.

Each pig, immunized 3 weeks beforehand with one of the vaccines, received 4 i/d injections containing 1, 10, 100 and 1,000 minimal reactive doses; the doses of the virulent strain against which the vaccination proved or did not prove to be effective were read after 4 days by observing the local reactions.

This method of evaluation is considered to be more reliable than that carried out on mice. [A German version of this work was published in *Acta vet. Acad. Sci. hung.* **9,** 469–474 (1959).]—A. SEBESTENY.

Ungureanu, C., Dorobanţu, R. (1959). Cercetări comparative privind sensibilitatea in vitro la antibiotice a unor tulpini de Erysipelothrix rhusiopathiae şi Listeria monocytogenes. [**Comparison of sensitivity to antibiotics of Erysipelothrix rhusiopathiae and E. monocytogenes.**]—Lucr. Inst. Pat. Igiena anim., Bucureşti **9,** 125-131. [In Roumanian. Summaries in French and Russian.] **1691**

Multiplication of ten strains of each organism was inhibited most by penicillin, followed by tetracycline, chlortetracycline, chloramphenicol and streptomycin. *E. rhusiopathiae* was more sensitive to penicillin and streptomycin and more resistant to tetracycline, chlortetracycline and chloramphenicol than *E. monocytogenes.*—M.G.G.

Jasińska, S., Wachnik, Z. (1959). Poziom aglutynin przeciw Listeria monocytogenes w surowicach bydła zdrowego. [**Listeria agglutinins in the serum of healthy cows.**]—Med. Wet., Warszawa **15,** 695-696. [In Polish. Summaries in English and Russian.] **1692**

Agglutination tests on serum from 1,687 clinically healthy cattle of various ages revealed: no agglutination in 975 cases; titres between 1 : 10 and 1 : 40 in 681 cases; 1 : 60 in 27; and 1 : 160 to 1 : 320 in 4.

Parallel examination of serum and whey samples from 66 cows failed to reveal a titre above 1 : 80 in the serum and above 1 : 40 in whey. The authors consider that the low proportion of animals giving a higher titre may indicate that the listeria agglutination test in cattle may, after all, be a specific reaction.

—M. GITTER.

Kita, J. (1959). Przyczynek do występowania listeriozy owiec w Polsce. [**Listeriosis in sheep in Poland.**]—Med. Wet., Warszawa **15,** 701-703. [In Polish. Summaries in English and Russian.] **1693**

An account of an outbreak in lambs. The clinical symptoms were dulness, pyrexia (40·5 to 41°C.), pallor of visible mucous membranes, muco-purulent discharge from eyes and nostrils, loss of appetite, salivation, grinding of teeth and diarrhoea in some. Most of the affected animals held their heads to one side, and moved in a trotting fashion. Falling down and "pedalling" with all limbs were also noted. Death followed within 3–5 days. P.M. examination revealed hydropericardium and congestion of cerebral meninges. *Erysipelothrix monocytogenes* was recovered from brain, liver, spleen and kidneys and histological examination of brain revealed the characteristic lesions. Mice, g.pigs and rabbits inoculated with 20% sheep brain suspension died within 3–4 days, and the organism was recovered from them. Two of four lambs treated with chlortetracycline recovered. Blood agglutination tests revealed a titre of 1 : 80 in 6 of 44 in-contact animals.

—M. GITTER.

Lysenko, I. P., Tsymbal, A. M., Kul'bachnaya, M. Z. (1959). [**Resistance of pigs to experimental listeria infection.**]—Nauch. Trud. Ukrain. Inst. eksp. Vet. **25,** 241-251. [In Russian.] **1694**

37 pigs aged 2–5 months did not become ill after inoculation of *E. monocytogenes* into the mouth, nose, conjunctiva; or by s/c, i/p, i/m, intracerebral or intratracheal injections. Single doses of 16,000 million organisms or repeated doses of 4,000 million were given. Attempts to provoke illness by subsequent nonlethal infection with paratyphoid or by oral administration of paratyphoid toxin or parenteral inj. of hyaluronidase also failed. Inoculated pigs remained carriers of the organism for more than two months.

—R.M.

Avery, R. J., Byrne, J. L. (1959). **An attempt to determine the incidence of Listeria monocytogenes in the brain of mammals.**—Canad. J. comp. Med. **23,** 296-300. [Summary in French.] **1695**

In a survey, brains of mammals and birds, or the medullary sections, collected at various federal veterinary laboratories in Canada for routine necropsy or those from negative rabies specimens were examined culturally for listeria. Over four years 14 isolations were made from 349 specimens. Eight were from chinchillas, two from chickens and one each from dog, fox, sheep and rabbit. (One isolate together with rabies virus was obtained from the brain of the fox.)—R. V. L. WALKER.

Yazykova, K. N. (1959). **[Pathological changes in internal organs and the brain of laboratory animals infected with listeria.]**—Nauch. Trud. Ukrain. Inst. eksp. Vet. **25,** 253-267. [In Russian.] **1696**

In the brain of infected mice, rabbits and g.pigs lesions were localized in the medulla oblongata, pons, corpora quadrigemina and also the hippocampus and the occipital lobe.

—R.M.

McBride, M. E., Girard, K. F. (1960). **A selective method for the isolation of Listeria monocytogenes from mixed bacterial populations.** —J. Lab. clin. Med. **55,** 153-157. [Authors' summary modified.] **1697**

A method and medium have been developed for the isolation of *Erysipelothrix (Listeria) monocytogenes* from mixed cultures as it commonly occurs in pathological material. This consists of an enrichment broth in which the organisms are incubated for 18 hours, then streaked on a solid selective medium. *E. monocytogenes* produces grey colonies in 24 hours. Other organisms present could be easily differentiated by their appearance.

Niilo, L. (1959). **Some observations on Pseudomonas infection in poultry.**—Canad. J. comp. Med. **23,** 329-337. **1698**

Four outbreaks of *Pseudomonas aeruginosa* infection in chickens, turkeys and ducks occurred in Alberta. Clinically there was general depression with diarrhoea and frequentlv severe keratitis. A detailed report is presented on the laboratory investigations with particular emphasis on the antibiotic sensitivity of the micro-organism and its pathogenicity in experimental birds. It is suggested that predisposing factors are usually present prior to infection.

—R. V. L. Walker.

Shirlaw, J. F. (1960). **Observations on calf diseases in Kenya. II. Calf scours: coli-bacillosis of calves, with special reference to vaccination.**—Brit. vet. J. **116,** 69-80. **1699**

24 strains of *Escherichia coli* were isolated from scouring calves in Kenya; 19 fermented saccharose, 2 salicin, and 3 both carbohydrates. Many showed some resistance to sulphonamides and antibiotics. Three from farms where sulphathiazole had been used resisted 200 mg.% of the drug. All of 6 strains were pathogenic for mice. Ten strains belonged to six O groups. The O group of 2 strains was not identified. Colostral whey from 5 cows inoculated with a formolized vaccine prepared from 3 of the strains and an English strain did not contain antibody. Serum from 2 immunized steers contained agglutinins at low titre, and did not protect mice. The liver of 21 calves slaughtered *in extremis* had a low vitamin A content.

—M.G.G.

Gerola, E. (1960). Rilievi clinici sull'impiego della colimicina nelle gastroenteriti neonatali del vitello. **[Colimycin in the treatment of diarrhoea of new-born calves.]**—Progr. vet., Torino **15,** 116-118 & 120. **1700**

Colimycin was administered to 23 calves with diarrhoea. Of these, 3 died and the rest (of which 3 had been unsuccessfully treated with other antibiotics) recovered. Optimum dosage was 4–5 million units over 12–24 hours.

—T.E.G.R.

Giovaneli, D. N., Ansorena de Rizzo, M. A., Colak, M., Hinsh, O., Espeja, W. (1959). Colibacilosis de los corderos. **[Colibacillosis in lambs.]**—Gac. vet., B. Aires **21,** 147-152. [Summary in English.] **1701**

Bacteria of the coli-aerogenes group were isolated from bone-marrow, blood and liver of lambs which died within 48 hours of birth. Lamb dysentery was ruled out. Losses on the property investigated amounted to 30–50 lambs daily over 5 days [total number of sheep not stated].—R.M.

Ørskov, F., Ørskov, I., Rees, T. A., Sahab, K. (1960). **Two new E. coli O-antigens: 0141 and 0142 and two new coli K-antigens: K85 and K86.**—Acta path. microbiol. scand. **48,** 48-50. [In English.] **1702**

The strain "RVC 2907" isolated by Rees from pigs with oedema disease [*V.B.* **30,** 25] was examined at the International Salmonella and Escherichia Centre in Copenhagen and was found to contain a new O-antigen numbered O141 and a new K-antigen numbered 85. The antigenic formula was O141:K85 (b) : H4. The other strain described in this paper was of human origin.—R.M.

Ribi, E., Hoyer, B. H., Milner, K. C., Perrine, T. D., Larson, C. L., Goode, G. (1960). **Physical and chemical analysis of endotoxin from Salmonella enteritidis.**—J. Immunol. **84,** 32-47. [Authors' summary modified.] **1703**

Some physical and chemical properties of the aqueous ether extract from *S. enteritidis* (grown in synthetic medium) possessing the biological properties of a Boivin-type antigen are described. Preparations containing only 1–4% bound lipid were as toxic as salmonella

endotoxins containing 15–30% bound lipid and induced in mice specific resistance to challenge with virulent *S. enteritidis*, whereas a fraction comparable to Westphal's "lipid A" was inactive.

Gordon, W. A. M., Luke, D. (1959). **A note on the use of the 9R fowl typhoid vaccine in poultry breeding flocks.**—Vet. Rec. **71,** 926-927. [Authors' summary modified.] **1704**

The value of the 9R living attenuated vaccine in the control of fowl typhoid has been confirmed in Northern Ireland. Its use in adult fowls in breeding flocks is described. In two such flocks blood agglutinins developed to the extent of 6%.

The vaccinal strain was isolated 11 months after vaccination and there was presumptive evidence that vaccination of adult birds with the rough strain may induce lesions in the ovary in some birds.

Geissler, A. (1958). Die Kolloid-Komplementbindungsreaktion (KKBR), eine neue serologische Reaktion für die Untersuchung auf Abortus-Bang. **[The colloid-complement fixation reaction in the diagnosis of brucellosis.]** —Mh. VetMed. **13,** 586-590. **1705**

G. described the technique of a new modification of the c.f. test based on the introduction of a third system (complement plus colloid) as a second phase. The colloid substance chosen was polyvinylpyrrolidone which had been found capable of non-specific combination with fresh g.pig complement, and also of combination with a substance (present in blood serum) which can be specifically altered by the action of an antigen (*i.e.*, by immunization, or infection) but without losing its capacity to combine with colloid in the absence of antigen.

When tested on cattle (a) previously vaccinated with killed *Br. abortus* and then infected conjunctivally 12 days later, or (b) vaccinated with Strain 19, the colloid c.f. test was positive at the same time as the first agglutinins appeared, and became negative much sooner. Tested on 11 cattle the classical c.f. test gave very equivocal results when compared with both the agglutination and the colloid test, especially the latter. Compared with the c.f. test, the colloid reaction has no zone phenomena, it becomes positive much sooner, and is technically relatively simple. The reaction is probably due to the same antibody as the indirect c.f. reaction. Further tests on other diseases are advised.

—W. K. Dunscombe.

Geissler, A. (1959). Das Prozonenphänomen bei der Komplement-Bindungsreaktion auf Abortus-Bang. **[Inhibition zones in the complement-fixation reaction in brucellosis.]** —Mh. VetMed. **14,** 46-50. **1706**

During c.f. tests on the serum of heifers to test the protection afforded against *Brucella abortus* by certain vaccines, G. found inhibition zones in 5 of 14 animals. These occurred in different sera at different times and some were intense. The zones were not proportional to antibody titres, were unrelated to clin. symptoms, and did not occur in other serological tests. The inhibition zones were due to a specific first-order antibody, possibly the same as that demonstrated by the indirect c.f. test or the colloid c.f. test [see preceding abst.]. This antibody can bind soluble antigen even in the absence of complement, but if there is complete fixation of complement such zones cannot occur. Experimentally it was possible to evoke such zones in positive sera by adding an excess of complement : hence the phenomenon is the result of deficient antigen. It can be eliminated if the serum is first heated to 62°C., if the antigen concentration is increased, or if the colloid c.f. test is carried out.—W. K. Dunscombe.

Rosaschino, F., Redaelli, G. (1959). Valore e limiti della reazione di Coombs nella diagnosi di brucellosi bovina. **[The Coombs test for bovine brucellosis.]**—Arch. Vet. Ital. **10,** 319-331. [Summaries in English, French and German.] **1707**

Of 600 sera from cattle, 458 originally negative or weakly positive to the agglutination test fell into two groups : 163 from (Strain 19) vaccinated cattle, 295 from non-vaccinated. On retesting 406 were again serologically negative. In 386 of the 458 the Coombs (C) test titres corresponded to the agglutination titres; in 52 they were higher, and in 20 lower. In the C test 5 gave a titre of 1 : 160 or higher : 3 of these had aborted, and 2 had come from a known infected area. A C titre of 1 : 160 was considered definitely positive. 31 of the vaccinated and 39 of the non-vaccinated were C-positive. The C-positive reactions of vaccinated animals could not be explained. The C test becomes positive earlier and remains positive longer than agglutination, and though too laborious for routine use it is of value for confirmation in doubtful cases.—W. K. Dunscombe.

Reusse, U. (1959). **Quantitative determination of Brucella in cow's milk by means of mem-**

brane filtration.—Bull. World Hlth Org. **21,** 782-784. **1708**

The number of brucella in a sample of milk was assessed accurately by adding an emulsifying agent to the milk, which was then passed under suction through a membrane filter, washing residues of the emulsifying agent out of the filter disk with saline soln., placing the disk on W medium containing triphenyltetrazolium chloride, and incubating at 37°C. for 6 days.—M.G.G.

Geissler, A. (1959). Die Beziehungen zwischen Katalaseakivität und Virulenz der Brucellabakterien. I. Experimentelle Untersuchungen an weissen Mäusen. II. Experimentelle Untersuchungen an Rindern. [**Relationship between catalase activity and virulence of brucella. I. Experiments on mice. II. Studies on cattle.**] —Zbl. VetMed. **6,** 429-440 & 625-633. [Summaries in English, French and Spanish.] **1709**

I. From mouse infection tests using smooth forms of the following strains :— 10 *Br. abortus,* 5 *Br. melitensis,* 21 *Br. suis* (16 American, 5 Danish) it was concluded that for *Br. suis* catalase activity was not correlated with virulence; the variation for *Br. abortus* was less though there was still no correlation. *Br. melitensis* was rather less virulent than the other two species. G. considered catalase activity, but not virulence, to be related to the species; catalase activity was not proportional to virulence in individual strains; falls in catalase activity and virulence ran parallel to S–R change; catalase activity was a very labile reaction.

II. 28 heifers (11 unvaccinated, 13 vaccinated with killed *Br. abortus* and 4 vaccinated with Strain 19) were used in infection experiments, using strains L 18 and 610 of *Br. abortus* and the Klatt strain of *Br. suis,* a mixed or individual suspension of 225 million organisms per ml. being given into the conjunctiva. The bovine strains were much more virulent for cattle than *Br. suis,* and the L 18 strain (thionine-resistant) more virulent than Strain 610, (though their catalase activity did not differ greatly. The catalase activity of a brucella strain was no indication of its virulence for cattle, and the assumption that because its catalase activity is high *Br. suis* is therefore very virulent for cattle was unjustified.—W. K. Dunscombe.

Prohászka, L. (1959). Szarvasmarhák immunizálása brucellosis ellen új él'ócsírás oltóanyaggal. [**A live vaccine against bovine brucellosis.**]—Mag. állator. Lapja **14,** 380-382. [In Hungarian. Summaries in English and Russian.] **1710**

A vaccine was produced by ultra-violet irradiation from a strain of *Brucella abortus* labelled "K6" which culturally and biochemically and in its high penicillin sensitivity was distinct from Strain 19 but had a similar low virulence for mice and g.pigs. (1) Of 50 heifers aged 6–20 months which were immunized with 5×10^{10} organisms of the K6 strain in a single s/c injection, 19 calved normally and 1 aborted; of 55 heifers immunized with Strain 19 vaccine, 21 calved normally and 1 aborted, while of 50 controls, 12 calved normally and 7 aborted; all were exposed to the same degree of natural infection. (2) In a herd in which abortion due to *Br. abortus* was sporadic, 80 heifers were immunized with the K6 vaccine. No abortion occurred amongst the immunized animals. During both trials agglutination and c.f. tests were made repeatedly on the sera of the immunized heifers. After 3 months agglutinins were found in a low (1 : 10; 1 : 20) titre in the sera of only a few animals. (3) In a herd which had a high degree of infection with *Br. abortus* 150 cows were immunized with the K6 vaccine, after which no abortions were observed. The author considers that the K6 vaccine is as good as Strain 19.

—A. Sebesteny.

Meyn, A., Schrinner, E. (1959). Zur Frage der Schutzimpfung gegen Rinderbrucellose mit Adsorbatimpfstoffen. I. Mitteilung. [**Adsorbed vaccine against bovine brucellosis. I.**]—Rindertuberk. u. Brucellose **8,** 147-158. **1711**

Of 36 calves free from TB. and brucellosis, 12 (aged 4–6 months) received two inoculations of a brucella adsorbed vaccine prepared by Lembke's method [*V.B.* **26,** 3107], 12 (aged 6–8 months) received freeze-dried Strain 19 and 12 were controls. Sera were tested fortnightly. In the adsorbed vaccine group some titres reached 1 : 160 but all sera were negative after 9 months. In the Strain 19 vaccinates titres as high as 1 : 640 occurred; 10 cows became serologically negative after 8 months, but 2 had persisting titres (1 : 40) and these and some others had a later rapid rise in titre, with final fluctuation between positive and negative.

All became pregnant when 2 years old and at the 5th month were challenged by inj. of *Br. abortus* Strain 544 into the conjunctiva. Fortnightly serological tests were made (agglutination, c.f. and paper electrophoresis,

the last named to be reported later). Nearly all sera were positive (1 : 40) at parturition; titres of 1 : 640 occurred in the first group and in controls but the max. in the Strain 19 group was 1 : 80. The c.f. test was positive (1 : 10 or more) in 10 of 11, 1 of 11, and 9 of 11 (controls); brucella was isolated from the placenta of all these reactors. With adsorbed vaccine, 10 aborted, 1 normal calving (c.f. negative, no rise in agglutination titre); with Strain 19 none aborted, but 1 was infected at term. The authors concluded that inoculation of calves at 4–6 months with adsorbed vaccine gives no protection against brucella abortion.
—W. K. Dunscombe.

Neumann, H.-J., Kahlcke, A. (1960). Zur Beurteilung der serologischen Reaktionen in bangschutzgeimpften Rinderbeständen. [**Evaluation of serological reactions in herds immunized against brucellosis.**] — Berl. Münch. tierärztl. Wschr. **73,** 44-46. [Summary in English.] **1712**

On account of discrepancies in the results of the slow agglutination test and Meinicke's flocculation test in herds immunized with Strain 19, it is considered that only the slow agglutination test should be used in such herds.
—M.G.G.

Payne, J. M. (1959). **The pathogenesis of experimental brucellosis in the pregnant cow.** —J. Path. Bact. **78,** 447-463. [Author's summary modified.] **1713**

The progress of *Br. abortus* infection was followed in 11 pregnant cows infected with Strain 544 (McEwen) by the conjunctival route.

The infection appears to drain from the conjunctiva into the parotid and other head lymph nodes, after which it spreads to lymphoid tissue elsewhere such as the spleen and iliac and supramammary lymph nodes. A mild acute lymphadenitis develops in each node so affected and hyperplasia of the dense cortical lymphatic tissue occurs. Later large numbers of plasma cells are formed in the medullary cords and the adjacent sinuses undergo severe catarrhal change.

The earliest lesion in the uterus appears to be inflammation in the connective tissue between the uterine glands. In these purulent secretion is soon formed, which when excreted into the uterine lumen (inter-cotyledonary space) appears to be the origin of the heavily infected uterine exudate so characteristic of the disease. Changes in the uterine wall lead to severe ulcerative endometritis.

Placental cotyledons slowly become involved by spread of exudate along the allanto-chorion. In addition this membrane itself is invaded so that the foetal blood and the placental fluids became infected.

At or near abortion infection spreads into the depths of the cotyledons; large numbers of brucella appear in the endothelial cells lining the foetal blood-vessels of the chorionic villi. The vessels are soon occluded and infection, followed by tissue destruction, spreads in the connective-tissue core of the villus. Eventually whole villi are destroyed and replaced by pus.

There is evidence of some kind of toxic reaction in organs such as the kidney which are at some distance from the sites where infection has been diagnosed.

The results suggest that in the pregnant cow *Br. abortus* localizes initially in the lymph nodes nearest the point of entry. It then spreads to lymphoid tissue elsewhere in the body. Blood-borne organisms infected the gravid uterus by way of the endometrium and uterine glands.

Bordogna, A. (1960). Osservazioni sull'uso sistematico di preparati ormonali e vitaminici per prevenire il "fattore aborto" nell'infezione brucellare. [**Use of hormone and vitamin preparations for the prevention of abortion in brucellosis.**]—Clin. vet., Milano **83,** 11-18. **1714**

Luteinizing hormone, luteosterone and vitamin E were administered to 19 pregnant cows with recent natural brucellosis. Results are considered satisfactory in that there was only one abortion and no retention of placenta.
—T.E.G.R.

Biondi, E., Londrillo, A., Francesconi, G. (1959). Ricerche sul comportamento delle agglutinine in cavie trattate con meprobamato e immunizzate con Br. abortus. [**Effect of meprobamate on the production of Brucella abortus agglutinins in guinea-pigs.**]—Acta med. vet., Napoli **5,** 507-515. [Summary in English.] **1715**

In immunized g.pigs treated with meprobamate agglutinin titres were lower than in untreated immunized controls.—T.E.G.R.

Maĭboroda, A. A., Parkhomenko, E. I., Semka, S. P. (1959). [**Field trials of U.I.E.V. killed brucella vaccine used on pigs.**]—Nauch. Trud. Ukrain. Inst. eksp. Vet. **25,** 205-211. [In Russian.] **1716**

The *Br. abortus* crystal violet vaccine previously described [*V.B.* **29,** 2017] was used

on an infected pig-farm. 31 gilts weighing 40–50 kg., negative to agglutination and c.f. tests, were given 5 ml. of vaccine as 5 injections at different sites each of 1 ml. They were re-vaccinated 20 days later, and after a further 25 days were placed in a piggery containing infected pigs, together with 19 unvaccinated controls. A third inoculation of vaccine (as a single dose) was given 2 months after the second; serological tests at this time indicated that 6 of the controls had become infected. When the gilts came into heat, about 6 months after the first inoculation, they were all served by a boar. Inoculated and control pigs were kept together in groups of 8, 10 or 12. Eleven months after first inoculation 16 of the 19 controls reacted to agglutination tests and 6 reacted to c.f. tests. Among the inoculated gilts 25 farrowed normally, 4 aborted (and *Br. suis* was isolated) and 2 were barren. Among the controls 6 farrowed normally, 8 aborted, 3 litters were stillborn and 2 gilts were barren.—R.M.

I. Vershilova, P. A., Chernysheva, M. I. (1959). **[Immunity of guinea-pigs inoculated with Br. abortus Strain 19-BA to the highly virulent Br. suis Strain 1330.]**—Veterinariya, Moscow **36,** No. 12 pp. 23-26. [In Russian.] **1717**

II. Bel'kov, N. F., Éismont, V. V., Shprinbakh, O. G. (1959). **[Excretion of brucella by cattle giving positive serological tests for a long time after inoculation of Strain 19 vaccine.]**—Ibid. pp. 26-29. [In Russian.] **1718**

III. Selivanov, A. V., Kosilov, I. A. (1959). **[Significance of positive diagnostic tests after inoculation of Strain 19 vaccine into sheep.]**—Ibid. pp. 29-32. [In Russian.] **1719**

I. *Br. suis* Strain 1330 from Weybridge was highly virulent for g.pigs. Generalized infection lasted for 30 days after inoculation of as few as 6 organisms. After s/c inj. of 6, 13 and 30 organisms the lymph nodes and parenchymatous organs became infected in every case. Pathological changes, clearly seen, 30 days after infection, were mainly necrosis and degeneration in all lymph nodes and also in liver and spleen.

The vaccine strain *Br. abortus* 19-BA (used for immunizing human beings) was inj. s/c in g.pigs in doses of 1,000 million organisms. On challenge 30 days later 11 of 14 g.pigs resisted 2 infective doses (I.D.), 10 of 14 resisted 5 I.D., 7 of 14 resisted 25 I.D. and 2 of 14 resisted 250 I.D.

Histopathological changes in immunized and challenged g.pigs were described. The results were taken to confirm that immunity to brucellosis was not type specific.

II. Cows that gave persistent high titres to agglutination and c.f. tests 3–4 years after inoculation of Strain 19 vaccine should be regarded as infected and isolated from the rest of the herd.

III. Persistent reaction to the i/d allergic test together with positive titres to agglutination or c.f. tests a year after inoculation of Strain 19 vaccine, indicated infection with *Br. melitensis.* The results of diagnostic tests performed 9 months after re-vaccination showed a significant increase in positive reactions to agglutination and c.f. tests, compared with reactions after first vaccination.—R.M.

Krčméry, V. (1959). Peroxydázová aktivita brucel a jej využitie na rýchlu biochemickú typizáciu Brucella suis. **[Utilization of peroxidase activity of brucella for quick typing of Br. suis.]**—Vet. Čas. **8,** 578-582. [In Slovak. Summaries in English, French, German and Russian.] **1720**

Differentiation of *Br. suis* by the peroxidase reaction was described. To 1 ml. of standardized *Br. suis* suspension 0·25 ml. of a 0·5% soln. of pyrogallol and 0·25 ml. of a 30% soln. of H_2O_2 were added. A positive reaction was indicated by darkening of the mixture and effervescence, whereas no such reaction was demonstrable in 48 brucella strains other than *Br. suis.* The catalase–peroxidase relationship in brucella was discussed.—E.G.

van Drimmelen, G. C. (1959). **Diagnosis of brucellosis in sheep and goats.**—J. S. Afr. vet. med. Ass. **30,** 259-269. [Author's abst.] **1721**

A preliminary report on the diagnostic procedures applied in brucellosis of sheep and goats, with special reference to the genital brucellosis of Merino sheep in South Africa.

Gdovin, T. (1959). Umelá infekcia mladých baránkov kmeňmi infekcnej epididymitídy. **[Experimental infection of young rams with infectious epididymitis.]**—Folia vet., Košice **3,** 183-192. [In Slovak. Summaries in English, German and Russion.] **1722**

Twenty ram lambs 2–4 months old were infected intravenously, subcutaneously, conjunctivally, subconjunctivally and intraprepu-tially with *Brucella ovis.* One died 19 days later, eight developed characteristic testicular

and epididymal lesions 26–29 days after infection. Spontaneous, acute infection in two young rams was also described.—E.G.

I. Tudoriu, C. D., Andrei, M., Cambir, S., Moldoveanu, P., Ionică, C. (1959). Studiu epizootologic asupra epididimitei infecţioase a berbecilor. [**Epidemiology of infectious epididymitis in rams.**]—Lucr. Inst. Pat. Igiena anim., Bucureşti **9**, 59-69. [In Roumanian. Summaries in French and Russian.] **1723**

II. Tudoriu, C. D., Ionică, C., Cambir, S. (1959). Cercetări pentru izolarea şi tipizarea tulpinilor bruceloide (Br. ovis) de la berbeci cu epididimită infecţioasă. [**Isolation and typing of brucella strains from rams with infectious epididymitis.**]—Ibid. 71-87. [In Roumanian. Summaries in French and Russian.] **1724**

I & II. Infectious epididymitis was diagnosed, clinically and by agglutination tests with *Brucella ovis* antigen, in 240 of 5,374 rams in 23 flocks. Abortions occurred among ewes mated to infected rams. 17 strains of *Br. ovis* were isolated, of which the morphological, cultural, biochemical and antigenic properties are described.—M.G.G.

Mitchell, D., Boulanger, P. (1959). **Leptospirosis in Canada. IV. An atypical mastitis in cattle due to Leptospira pomona.**—Canad. J. comp. Med. **23**, 250-255. [Summary in French.] **1725**

Combined field and laboratory investigations of outbreaks of bovine leptospirosis in Ottawa during the past three years have yielded interesting data. From two naturally infected cases of atypical mastitis, *L. pomona* was isolated. The authors described the clinical, serological and bacteriological findings in two herds of cattle, in one of which these isolations were made. They discussed the practical implications and importance of the findings.—R. V. L. Walker.

Muraschi, T. F. (1959). **A simple screening test for the detection of leptospirosis in human beings and animals.**—Amer. J. publ. Hlth **49**, 1074-1078. **1726**

The latex-agglutination test for detecting leptospira antibody is described. It uses a mixed suspension of 3 or 4 killed leptospiral serotypes and polystyrene latex particles of 0·81 μ. When performed with killed *L. icterohaemorrhagiae, pomona* and *canicola* as antigen, it was positive for all 98 cattle sera containing antibody against *L. pomona,* all 7 dog sera with antibody against *L. canicola,* and 16 of 21 human sera containing antibody against other serotypes. The test could be used for titrating antibody against individual serotypes.—M.G.G.

Dózsa, I., Kemenes, F., Szent Iványi, T. (1959). Az ún összetett-gyomrúak (Pecora) vörösvérsejtjeinek fogékonysága a pathogen leptospirák haemotoxinja iránt. [**Susceptibility of erythrocytes of ruminants to leptospiral haemotoxin.**]—Mag. állator. Lapja **14**, 382-386. [In Hungarian. Summaries in English and Russian.] **1727**

The haemolytic effect of the haemotoxin produced by *Leptospira canicola, pomona* and *grippo-typhosa* on the r.b.c. of 212 animals of 44 domestic, laboratory and wild species were examined. The haemotoxin acted on the r.b.c. of only certain species of ruminants; it readily haemolysed the r.b.c. of the Pecora (*e.g.* cattle, sheep, goats, deer, etc.) and either failed to haemolyse or haemolysed only in low dilutions the oval r.b.c. of the Tylopoda (*e.g.* camel, llama). Toxins of *L. icterohaemorrhagiae, hyos, biflexa* and *sejroe* had no action on the r.b.c. of any of these 44 species.

Filtrate of *L. pomona* culture given in a single dose of 220 ml. i/v to a deer weighing 15 kg. and of 120 ml. i/v given to a lamb caused severe symptoms of haemolysis in both, and death of the deer, while daily i/v doses of 10–15 ml. of the filtrate continued for 2–3 weeks caused no symptoms in 3 rabbits.

The authors suggest that in cases of jaundice and haemoglobinuria in wild and domestic ruminants leptospirosis should be considered as well as babesiosis, but a similar picture in the horse would primarily suggest babesiosis.—A. Sebesteny.

Oakley, C. L., Warrack, G. H. (1959). **The soluble antigens of Clostridium oedematiens type D (Cl. haemolyticum).**—J. Path. Bact. **78**, 543-551. [Authors' summary.] **1728**

Clostridium haemolyticum produces two soluble antigens; one is a calcium-dependent necrotising lethal lecithinase, active against sheep and horse red cells, and antigenically indistinguishable from the β-lecithinase of *Cl. oedematiens* type B; the other is a substance (*Cl. oedematiens* θ-antigen) producing opalescence in egg-yolk emulsions, but possessing no haemolytic, necrotising or lethal activity. No *Cl. oedematiens* α-toxin is produced by any strain examined.

It is suggested that in papers on classification or on immunology the organism should be referred to as *Cl. oedematiens* type D.

I. Watts, P. S. (1959). **Comparison of vaccines against enterotoxaemia.**—Aust. vet. J. **35,** 317. **1729**

II. Hart, L. (1959). **Enterotoxaemia vaccines.**—Ibid. 431. **1730**

I. To test protection given by 4 commercial enterotoxaemia vaccines, the dilution of antitoxin (produced in rabbits) that would protect mice against 4 m.l.d.$_{50}$ was compared for each vaccine. Protection conferred varied up to 30 times between the best and the worst vaccine.

II. H. points out that two of the vaccines tested by Watts were below the minimum British Veterinary Codex standard of 2·0 units antitoxin/ml. He states that one of the laboratories which prepares one of the vaccines tested by Watts has adopted as its standard Bullen & Battey's [*V.B.* **28,** 1377] figure of 0·1 antitoxin units/ml. in the blood of vaccinated sheep.—W. E. Lawrence.

Bittner, J., Winter, D., Olaru, A. (1959). L'action de l'acide ethylène diamino tetra-acétique (E.D.T.A.) et de ses complexes métalliques sur l'intoxication et l'infection expérimentale avec le Cl. perfringens type A. I. L'action de l'acide et des divers complexes EDTA sur l'alphatoxine du Cl. perfringens de type A "in vitro" et "in vivo". **[Protection against Clostridium welchii Type A by ethylenediamine tetra-acetic acid and its compounds. I.]**—Arch. roum. Path. exp. Microbiol. **18,** 467-474. [In French. Summaries in English, German and Russian.] **1731**

The disodium salt of ethylenediamine tetra-acetic acid had the greatest inhibitory effect on *Cl. welchii* Type A toxin *in vitro*. It was 4 times more active than the calcium chelate (sodium calciumedetate), and 240 times more active than the zinc chelate. The i/v protective doses for mice were much greater than the amounts inhibiting the toxin *in vitro*.—M.G.G.

McGaughey, C. A. (1959). **'Six-day disease' of chicks.**—Ceylon vet. J. **7,** 41-46. **1732**

An account is given of 5 outbreaks of "six-day" disease of chicks. Experimental infection was achieved by feeding suspensions of bowel contents of infected chicks but not by parenteral inoculation of extracts of liver, lungs or blood. Toxin was not demonstrable in the bowel. Aerobic culture of liver and of blood yielded coliform organisms, enterococci or, in many instances, no organisms. In anaerobic culture an organism was isolated which resembled *Clostridium welchii* morphologically and culturally but was non-toxigenic, non-haemolytic and non-pathogenic for mice, g.pigs or chicks on parenteral inoculation. The disease was reproduced in day-old chicks by feeding fresh meat culture or sporulating culture and the organism was recovered from the chicks.—T.E.G.R.

Adler, H. C. (1959). **Genital vibriosis in the bovine. An experimental study on the influence on early embryonic mortality.**—Acta vet. scand. **1,** 1-11. [In English. Summaries in German and Danish.] **1733**

Twenty heifers in oestrus were inseminated with semen of known fertilizing capacity and at the same time inoculated with *Vibrio fetus*. Half the heifers were killed and examined for embryos 2 weeks later. The others were observed for return of oestrus; this occurred in all ten after about 3 weeks, when they were again inseminated and killed 14 days later. An embryo was recovered from 17, but only 8 were apparently normal. *V. fetus* was recovered from the uterus of 19 in all cases from the cervical canal, less frequently from the basal region of the uterine horns and occasionally from the apical parts. These results indicate that *V. fetus* does not prevent fertilization but provokes embryonic death 2–3 weeks after fertilization.

—A. Ackroyd.

Bryans, J. T., Smith, A. G., Baker, A. J. (1960). **Ovine vibrionic abortion caused by a new variety of Vibrio.**—Cornell Vet. **50,** 54-59. **1734**

Two *Vibrio* strains from aborted foetuses in 2 unconnected sheep flocks in Kentucky formed both catalase and hydrogen sulphide, and were antigenically distinct from 4 strains of *V. fetus* from sheep in Montana and Illinois.—M.G.G.

Pryor, W. J. (1959). **Two foot syndromes in sheep following excessive foot bathing.**—Aust. vet. J. **35,** 493-494. [Author's summary modified.] **1735**

Skin trouble resulting from excessive foot-bathing with formalin or arsenical solutions is described. It did not interfere with locomotion, but it could complicate foot rot eradication plans. The maximum desirable amount of foot-bathing with these two medicaments was 4–5 min. exposure once a week. The use of so-called additives to formalin in foot-baths is deprecated in the absence of any critical work on their value.

Fey, H. (1959). Differenzierungschema für gramnegative aerobe Stäbchen. **[Scheme for differentiating Gram-negative aerobic bacteria.]**—Schweiz. Z. allg. Path. **22,** 641-652. **1736**

F. described a scheme for cultural differentiation of pathogens encountered in veterinary investigations.—R.M.

Mocquot, G., Béjambes, M. (1959). **Bacteriology of goats' milk and ewes' milk and their products.** — Dairy Sci. Abstr. **21,** 531-537. **1737**

The various organisms which have been isolated from goats' and ewes' milk and their products and methods used for their detection are reviewed. Frequently in both goats and ewes, practically sterile milk samples can be obtained from the udder by aseptic methods. Caprine mastitis is usually caused by streptococci or staphylococci, whilst staphylococci associated with *Clostridium welchii* cause gangrenous mastitis, the most frequent udder infection of milking ewes.—A. Ackroyd.

Hagen, O., Skulberg, A. (1960). Halesår hos gris. **[Tail sores in pigs.]**—Nord. VetMed. **12,** 1-20. [In Norwegian. Summaries in English and German. English summary modified.] **1738**

A description is given of tail sores in pigs and their significance in meat inspection evaluated [see also *V.B.* **29,** 3411].

A possible relationship between tail sores and pyaemic conditions was studied.

The local chronic suppurations in the tails were recorded as abscesses and osteomyelitis caused by corynebacteria.

In 40 out of 52 cases haemorrhagic infarcts, which in the later stages developed into abscesses, were found in the lungs. Abscesses were also demonstrated in kidneys and spinal column.

The causes of tail biting are discussed, and possibilities for prophylactic measures are suggested. Proper treatment of tail damage at an early stage, or in certain cases an amputation of the affected tail is proposed.

Webb, S. J. (1960). **Factors affecting the viability of air-borne bacteria. II. The effect of chemical additives on the behaviour of air-borne cells. III. The role of bonded water and protein structure in the death of air-borne cells.**—Canad. J. Microbiol. **6,** 71-87 & 89-105. **1739**

Death of air-borne cells was connected with the "bound water" of the cell and its relationship with ions, molecules, and atmospheric water vapour. Polyhydroxy and amino compounds could enhance the aerosol survival of bacteria, and these compounds were probably able to replace water molecules in protein structure during periods of desiccation. —R.M.

Gurova, E. I. (1959). **[Factors influencing the survival of pathogenic bacteria in soil.]**—Nauch. Trud. Ukrain. Inst. eksp. Vet. **25,** 269-280. [In Russian.] **1740**

Cultures of bacteria were mixed into damp non-sterilized soil of the black-earth type (pH 7) placed (in Petri dishes) in layers 1 cm. thick, at a concentration of 250 million organisms in 1 g. of soil. Periods of survival under summer conditions were: *Pasteurella septica* (avian type) 15–25 days; *Erysipelothrix rhusiopathiae* 21–30 days; *Salmonella typhi-murium* 10–18 weeks; *Bacillus anthracis* spores at least 8 years. Under winter conditions all the organisms (except anthrax spores) survived for 4–5 months. In direct sunlight they were killed within 2–5 hours. Survival in sterilized soil was much longer. The antibiotic activity of common soil bacteria on the animal pathogens was studied.—R.M.

Rehkemper, J. A. (1959). **Coccidioidomycosis in the horse. A pathologic study.**—Cornell Vet. **49,** 198-211. **1741**

The clinical description of this first recorded case of coccidioidomycosis has been given elsewhere [*V.B.* **29,** 345]. This is a description of the histopathology. The lesions were of the chronic granulomatous type seen in man and other animals. The lungs and spleen were most severely affected, the liver and kidneys less so. The cause of death was rupture of the liver, probably contributed to by secondary amyloidosis. Giant cells were present. Organisms were plentiful, both free and within macrophages. —E. G. White.

Janowski, W., Jasińska, S. (1959). Moniliaza jagniąt na tle zakażenia pokarmowego. **[Alimentary moniliasis in lambs.]**—Med. Wet., Warszawa **15,** 753-754. [In Polish. Summaries in English and Russian.] **1742**

An account of an outbreak in which 17 out of 210 lambs died within a week. P.M. examination of the one lamb revealed ecchymoses on the epicardium and congested liver and kidneys. *Candida albicans* was isolated from the heart blood, lungs, spleen and from sugar beet pulp fed to these lambs. Other sheep on the same farm but fed no sugar

beet pulp were not affected. The outbreak ceased when sugar beet pulp was withdrawn from the diet.—M. GITTER.

Saez, H. (1959). Recerche de Candida albicans dans les fécès de quelques animaux sauvages en captivité. [**Search for C. albicans in faeces of some captive wild animals.**]—Rec. Méd. vét. **135,** 629-633. [Summaries in English and Spanish.] **1743**

During a survey at the zoo at Vincennes, *Candida albicans* was isolated from the faeces of four species only :— the great anteater, the European otter, the Indian small-clawed otter and the king penguin. Negative results were obtained from Axis deer, giraffe, okapi and Humboldt's penguins. Methods used for culture are described.—R. N. FIENNES.

Lindqvist, K. (1960). Ringorm hos husdyr i Norge. [**Ringworm in domestic animals in Norway.**]—Nord. VetMed. **12,** 21-28. [In Norwegian. Summaries in English and German. English summary modified.] **1744**

Trichophyton verrucosum was the most common species involved in ringworm of cattle. Endemic ringworm in horses was due to *T. equinum, Microsporum equinum* or *T. mentagrophytes,* while in dogs and cats it was caused by *M. canis.* Species of dermatophytes from sporadic cases are mentioned and probable reservoirs and habitats of dermatophytes are discussed. *Keratinomyces ajelloi* and *M. cookei* and their relation to dermatophytes were also mentioned.

Albett, R. E., Gill, E. A. (1950). **Griseofulvin in the treatment of Microsporum canis infection in dogs.**—Vet. Rec. **72,** 74. **1745**

Extensive *M. canis* infection in 4 puppies was eliminated by giving a daily dose of 25 mg. of griseofulvin per kg. body wt. by mouth for 2 or 4 weeks.—M.G.G.

Keep, J. M. (1959). **Griseofulvin in the treatment of feline ringworm.**—Aust. vet. J. **35,** 388. **1746**

Two kittens aged 8 weeks showing widespread *Microsporum canis* infection were treated orally with griseofulvin. The animals were clipped and ¼ × 250 mg. tablet was administered daily (according to body weight, 41 mg./kg. and 62 mg./kg.). The kittens were examined regularly with Wood's light and fungal cultures made of fluorescent hairs.

Numbers of fluorescent hairs started to decrease from the 20th day. On the 44th day only a few facial hairs fluoresced. Cultures were positive on the 20th day and negative on the 44th day. Further cultures were negative.
—AGNIJA AIZSTRAUTS.

Rosenthal, S. A., Goldfarb, N,, Baer, R. L. (1959). **Therapeutic and preventive effects of griseofulvin in guinea-pigs.**—J. invest. Derm. **33,** 419-426. **1747**

In *Microsporum canis* infections the minimum preventive oral dose was two-thirds the minimum curative dose. The protective effect was lost within 3 days after the drug was discontinued.—R.M.

Roth, F. J., Sallman, B. Blank, H. (1959). **In vitro studies on the antifungal antibiotic griseofulvin.**—J. invest. Derm. **33,** 403-418. **1748**

Griseofulvin inhibited the growth of dermatophytes but had no action on *Candida albicans, Cryptococcus neoformans, Nocardia asteroides, Aspergillus fumigatus, Histoplasma capsulatum* and some other fungi.—R.M.

Sharpe, H. M., Tomich, E. G. (1960). **Studies in the toxicology of griseofulvin.**—Toxicol. appl. Pharm. **2,** 44-53. **1749**

Griseofulvin was not very toxic: mice survived single oral doses of 50 g./kg. and rats of 10 g./kg. There was no evidence that it caused retinal damage. Feeding g.pigs a diet containing 0·5% of the drug for 12 months had no apparent harmful effect.—R.M.

Georg, L. K., Kaplan, W., Ajello, L., Williamson, W. M., Tilden, E. B. (1959). **The parasitic nature of the soil fungus Keratinomyces ajelloi.**—J. invest. Derm. **32,** 539-544. **1750**

The fungus was isolated from ringworm lesions on a squirrel and experimental infection was produced in g.pigs. The fungus has a wide distribution throughout the world.
—R.M.

Karasszen, D. (1959). Fiatal csirkék aspergillosisának gyógyítása belsőleg adagolt jódkáliummal. [**Treatment of aspergillosis in chicks with potassium iodide.**]—Mag. állator. Lapja **14,** 283-284. [In Hungarian. Summaries in English and Russian.] **1751**

In a flock of some 6,000 chicks, aged 1–2 weeks, aspergillosis resulted in 100% morbidity with 10–12 daily losses. Treatment was attempted with potassium iodide (5–10 g. per litre of drinking water). Apart from the 60 untreated controls, mortality ceased within 5 days and all clinical symptoms disappeared within about 10 days after treatment. Similar results were obtained after the treatment of

the 60 controls and two further similarly affected flocks. The author suggests the use of potassium iodide for the treatment of aspergillosis in chicks, but leaves open the questions of whether the treatment is also effective in adult birds, and whether it leaves subclinical carriers of the disease.—A. Sebesteny.

Signorini, G. (1960). Trattamento associato jodio-idrazide dell'acido isonicotinico (I.A.I.) dell'actinobacillosi bovina. [**Combined iodine-isoniazid therapy in actinobacillosis in cattle.**] —Veterinaria, Milano **9**, 53-55. **1752**

A mixture of isoniazid and isoniazid iodate was injected at a daily dosage of 10 mg./kg. body wt. intramuscularly and into the lesions. 5 or 6 daily doses cured actinobacillosis in 4 cows.—T.E.G.R.

Pepys, J., Riddell, R. W., Clayton, Y. M. (1959). **Human precipitins against common pathogenic and non-pathogenic fungi.** — Nature, Lond. **184**, Suppl. No. 17 pp. 1328-1329. **1753**

Agar-gel diffusion tests were performed on the sera of patients with *Trichophyton rubrum* infection or known to contain precipitins to *Aspergillus,* against antigens prepared from the minced fungal mycelium or from culture medium preparations of *T. rubrum* or *T. mentagrophytes* var. *interdigitale.* A number of antigens were found in each type of preparation, some of which were common to both species. In similar tests common antigens were found to be shared by the following pairs of species: *T. rubrum* and *Cladosporium herbarum; T. mentagrophytes* var. *interdigitale* and *Penicillium notatum; T. rubrum* and *Aspergillus fumigatus.* Inhibition tests indicated that common antigens existed in *A. fumigatus, Trichophyton* (unspecified) and *C. herbarum.*—W. E. Parish.

Ungureanu, C., Grecianu, A., Gogoaşă, V. (1959). Studiul unor tulpini de P.P.L.O. izolate din cavităţile nazale ale porcilor cu rinită atrofică. [**Pleuropneumonia-like organisms isolated from the nasal cavity of pigs with atrophic rhinitis.**]—Lucr. Inst. Pat. Igiena anim., Bucureşti **9**, 115-123. [In Roumanian. Summaries in French and Russian.] **1754**

PPLO were isolated from the nasal secretions of 3 of 102 pigs with atrophic rhinitis. They were resistant to penicillin, and sensitive to tetracycline, streptomycin, chlortetracycline and chloramphenicol. They were not pathogenic for lab. animals but killed chick embryos. Piglets 4–5 days old remained healthy after intranasal infection.—M.G.G.

Forray, A. (1959). A PPLO-csoportba tartozó csírák előfordulása sertésekben. [**Pleuropneumonia-like organisms from the lungs of pigs.**] —Mag. állator. Lapja **14**, 329-331. [In Hungarian. Summaries in English and Russian.] **1755**

In a herd of 80 pigs, wintered outdoors, an acute respiratory disease caused great losses with 4 deaths and 16 emergency slaughters within 16 days. Extensive bronchopneumonia was the main lesion. From the lungs and bronchial lymph nodes *Pasteurella* was isolated in 11 cases, *Salmonella cholerae-suis* var. *kunzendorf* in 6, *Haemophilus influenzae* in 2, *Bacterium viscosum equi* in 1, and PPLO in 3. The 3 PPLO cultures were maintained by passage at intervals of 1–2 days. One of the cultures died out in 14 days, the other two were used for infecting adult and 4-day-old mice, which tolerated without reaction 0·5 ml. doses of the culture suspension given i/p and s/c. The morphological, cultural, staining and biochemical characters and the antibiotic sensitivity of the isolated PPLO are described.

The author left open the question of the significance of the presence of the PPLO in the respiratory organs of pigs in general, but emphasized that in all three cases the PPLO were recovered together with pasteurella which are notorious secondary invaders.

—A. Sebesteny.

Tajima, M., Miyamoto, T. & Nagashima, H. (1958). **An outbreak of chronic respiratory disease of chickens in Japan.**—N.I.B.S. Bull. biol. Res., Tokyo **3**, 43-52. [In English. Authors' summary modified.] **1756**

In outbreaks among fowls in two farms in Tokyo and Osaka Prefectures, naturally infected birds were examined and chicks and embryos were inoculated. Chronic respiratory disease was diagnosed from the flock histories, conditions of outbreak, pathology, the results of bird and embryo inoculation studies, and isolation of pleuropneumonia-like organisms.

Padgett, G. A. & Schoenhard, D. E. (1959). **Effect of deoxycorticosterone on the agent of chronic-respiratory disease.**—Mich. St. Univ. Vet. **20**, 27-31. **1757**

Deoxycortone at concentrations of 0·2–0·8 mg. per 125 ml. inhibited almost entirely the growth of 4 strains of the agent of chronic respiratory disease. Three weeks

after intratracheal infection, 0·4 mg. of the drug was injected into the abdominal air sac of chickens on alternate days. The number of birds yielding the agent fell from 10 out of 10 after treatment for 8 days to 4 out of 10 after treatment for 24 days. At this dosage the drug was not toxic.—M.G.G.

Benton, W. J. & Cover, M. S. (1959). **The infectivity of blood and tissues from chickens with infectious synovitis.**—Avian Diseases **3,** 361-370. **1758**

In chickens inoculated i/v with the agent of infectious synovitis the blood was not infective 4 hours later, but was 8 hours later. After i/m inoculation the blood was not infective in 32 hours, but was in 48 hours. The infective titre of the blood of chickens inoculated i/m rose until the 4th day and remained constant until at least the 13th day. The agent was not demonstrated in the blood on the 52nd day, nor in joint exudate and organs on the 100th–128th days.—M.G.G.

Ford, A. C., Jr. & Murray, T. J. (1959). **Studies on Haemobartonella infection in the rat.**—Canad. J. Microbiol. **5,** 345-350. **1759**

Sprague-Dawley rats used for certain tumour transplantations, when splenectomized or under some form of stress were found to harbour the causal agent of murine haemobartonellosis. While the cultivated agent was infective for non-carrier rats under different forms of stress, infection could never be induced in Wistar rats. The infection is manifested by splenomegaly and severe anaemia, haematuria and haemoglobinuria, death usually about 10 days after spleen removal from latently infected rats.

Rats carrying Flexner-Jobling tumours fed on a diet of 12% casein appeared to be more susceptible to infection than those fed at lower levels of protein or at a level of 18% casein.

Methods of isolation and bacteriological studies of the agent are described and the effect of diet and tumours discussed. The results would suggest that certain tumours in higher animals may aggravate latent infections, if a sufficient amount of stress accompanies the tumour.—R. V. L. Walker.

See also absts. **1830** (combined swine fever—swine erysipelas vaccine); **1986** (meat as a source of salmonella-staphylococcal gastroenteritis in man); **2030** (report, Canada); **2031-2032** (reports, Australia); **2033** (report, Kenya); **2035** (book, bacterial diseases of animals).

DISEASES CAUSED BY PROTOZOAN PARASITES

Williamson, J. & Rollo, I. M. (1959). **Drug resistance in trypanosomes. I. Cross-resistance analyses.** — Brit. J. Pharmacol. **14,** 423-430. **1760**

Williamson, J. (1959). **Drug resistance in trypanosomes. II. Selective interference with trypanocidal action. III. Effects of metabolic inhibitors, pH and oxidation-reduction potential on normal and resistant Trypanosoma rhodesiense.** — Ibid. 431-442 & 443-455. [Authors' summaries modified.] **1761**

I. Eight strains of *Trypanosoma rhodesiense,* resistant respectively to atoxyl, butarsen, acriflavine, stilbamidine, Surfen C, suramin, and pontamine sky blue 5BX, have been examined for cross-resistance to nine structurally dissimilar groups of trypanocide. The results are discussed in relation to modes of trypanocidal drug action. Cross-resistance is not wholly explicable on an ionic basis; the results suggest that stereospecific structural changes associated with initial drug uptake occur in resistant trypanosomes.

II. Selective reversal of the trypanocidal action of carboxylated arsenicals by *p*-aminobenzoic acid and of melaminyl arsenicals and diamidines by melamine has been demonstrated. These reversals reflect the pattern of cross-resistance behaviour and suggest that cellular structures associated with a reversible stereospecific drug adsorption phase are modified during the development of resistance.

III. A wide variety of metabolic inhibitors tested *in vitro* for trypanocidal activity on normal and drug-resistant strains of *T. rhodesiense* showed no relation between acquired drug resistance and changes in specific enzymic function. Oxidation-reduction potential is an important factor in trypanocidal action but is not obviously related to the development of resistance. The dependence on pH of the trypanocidal action of ionizing drugs against both normal and resistant trypanosomes supports the postulate that the development of resistance involves physical changes in cell structures associated with the uptake of drug.

Lincicome, D. R. (1959). **Observations on changes in Trypanosoma lewisi after growth in calorically restricted and in normal mice.** —Ann. trop. Med. Parasit. **53,** 274-287. **1762**

Two isolates of *T. lewisi* grew in calorically restricted mice after serial transfers, only

if supported with rat serum. Trypanosomes which had not been passed through heterologous hosts grew less well, suggesting that the two isolates had become adapted to life in mice. Both isolates re-established themselves in rats; isolate A grew less well than the controls, whereas isolate C grew better. It is suggested that a lessening in antigenicity of C toward its natural host had occurred, resulting in more favourable environmental conditions.

The use of a combination of *T. lewisi* and a heterologous host is acceptable for the study of nutritional and other molecular relationships during parasitism.

—Brenda M. Wilson.

Pautrizel, R., Lafaye, A. & Duret, J. (1959). Anticorps et modifications plasmatiques au cours de la trypanosomose expérimentale du lapin par Trypanosoma equiperdum. **[Antibodies and changes in the plasma of rabbits infected with Trypanosoma equiperdum.]**—Rev. Immunol. **23,** 323-335. **1763**

Experimental infection in rabbits leading to death within 4–5 weeks, was characterized by an inversion of the albumin/globulin ratio, with a threefold increase in γ-globulins. After treatment with "Arsobal" [36% soln. of melaminyl-4-phenyl arsenosodithioglycerine in propylene glycol] the ratio tended to return to normal and some of the rabbits recovered. Antibodies appeared on the 3rd day and reached a low peak in 2–3 weeks.—M.G.G.

Doran, D. J. (1959). **Studies on trichomonads. III. Inhibitors, acid production, and substrate utilization by 4 strains of Tritrichomonas foetus.**—J. Prot. **6,** 177-182. **1764**

Manometric study of the metabolism of 48-hour-old organisms of four *Trichomonas foetus* strains showed that the main difference between the four strains is in their utilization of carbohydrates. From the results D. suggests that strain *Tr. foetus* A.1. shows a closer similarity to the nasal trichomonad of swine (PN-610) than does strain BP1. Probably PN-610 is a higher adapted strain of *Tr. foetus*.—Brenda M. Wilson.

Helf, H. & Kleemann, E. (1960). Zum Problem der Behandlung trichomonadeninfizierter Bullen. **[Treatment of trichomoniasis in bulls.]**—Tierärztl. Umsch. **15,** 14-16. **1765**

Of 13 bulls treated for trichomoniasis by washing the penis under local anaesthesia with a proprietary detergent soln. and swabbing with euflavine soln., 8 were cured by one such treatment, and another by 2 treatments.

—M.G.G.

Poole, D. B. R. (1960). **Protozoan organisms in chinchillas.**—Vet. Rec. **72,** 18. **1766**

In Scotland, protozoa morphologically similar to *Giardia* were found in the anterior part of the small intestine of 2 of 4 chinchillas that died suddenly 2–3 weeks after weaning. No lesions attributable to the protozoa were seen.—M.G.G.

Clarkson, M. J. (1959). **The life history and pathogenicity of Eimeria meleagridis Tyzzer, 1927, in the turkey poult.**—Parasitology **49,** 519-528. [Author's summary modified.] **1767**

A description is given of the life history and pathogenicity of a strain derived from a single oocyst infection and subsequently identified as *E. meleagridis*.

There are two asexual generations followed by the sexual generation. The first schizogony cycle occurs in the small intestine and the second and sexual generations in the caeca.

The organism is not pathogenic but the sexual stages produce marked caseous lesions in the caeca. It is immunologically distinct from a pure strain of *E. adenoeides* and cannot be transmitted to chickens.

Thiéry, G. (1959). Le bleu de toluidine dans le traitement eds coccidioses aviaires. **[Toluidine blue in the treatment of coccidiosis in fowls.]**—Rev. Élev. **12,** 301-303. [Summaries in English and Spanish.] **1768**

Flocks with coccidiosis were cured by the provision of a 1 : 1,000 soln. of toluidine blue as drinking water for 3–4 consecutive mornings, in combination with sanitary measures.

—M.G.G.

Beverley, J. K. A. & Watson, W. A. (1959). **Ovine abortion due to toxoplasmosis.**—Nature, Lond. **184,** Suppl. No. 26 p. 2041. **1769**

Inoculation of mice with brain and liver emulsions from 39 aborted lambs in Yorkshire revealed toxoplasma infection in 6. No other pathogen was found in these 6. The dye test was positive in 66% of ewes lambing normally, 72% of ewes aborting from viral or bacterial infection, and 82% of ewes aborting from other causes. Whether or not ewes infect their foetuses in successive pregnancies has yet to be established. Aborted material from 93 flocks showed evidence of infection by a virus

of the psittacosis-lymphogranuloma group in 29, by *Vibrio fetus* in 4, and *Salmonella dublin* in one.—M.G.G.

Shimizu, K. & Takagaki, Y. (1959). **Studies on toxoplasmosis. II. Some observations on strain "HT" which was isolated from a hare (Lepus timidus ainu) in Sapporo.**—Jap. J. vet. Res. **7**, 95-103. [In English.] **1770**

The "HT" strain isolated from a hare (for the first time in Japan, it is stated) was compared with standard strain "RH". HT was highly virulent for mice, causing death 5–6 days after i/p inj.—but the number of parasites was less than in the case of RH. Its virulence for rabbits and g.pigs was very low. —T.E.G.R.

Mackerras, M. J. (1959). **The haematozoa of Australian mammals.**—Aust. J. Zool. **7**, 105-135. **1771**

Haematozoa are recorded from a number of native Australian mammals, and include trypanosomes, spirochaetes, *Theileria, Babesia, Hepatozoon, Haemobartonella, Anaplasma, Eperythrozoon, Hepatocystis,* and *Polychromophilus.* In domestic cattle the following were recorded: *Trypanosoma theileri, Babesia bigemina, B. argentina, Theileria mutans, Anaplasma centrale, A. marginale, Haemobartonella bovis, Eperythrozoon wenyoni* and *Borrelia theileri. Trypanosoma melophagium* is present in sheep.—H. McL. Gordon.

See also abstr. **1866** (coccidia in calves); **2031-2032** (reports, Australia); **2033** (report, Kenya).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

Leunen, J. (1959). Application du "color test" dans l'étude du virus de la fièvre aphteuse. **[The "colour test" in the study of foot and mouth disease virus.]**—Bull. Off. int. Epiz. **51**, 409-416. [Summary in English.] **1772**

The test is used for the titration of F. & M. disease virus in culture and of antibodies in the serum of vaccinated animals. For titration of virus, 2 ml. of emulsion of bovine foetus kidney cells in a nutrient medium containing phenol red is added to tubes containing 1 ml. of virus diluted 10^{-1}–10^{-8}. Virus multiplication is indicated by persistence of the red colour; the colour changes to yellow in the tubes in which multiplication does not occur (this is due to the medium becoming acid after cell growth). For the titration of antibody, serum is diluted 2^{-1}–2^{-8}. To 1 ml. of each dilution is added 1 ml. of virus medium containing 100 U of LD_{100}. This is kept in a water-bath at 37°C. for 1 hour. Phenol red is then added. The tubes are incubated at 37°C. for 4–6 days. The serum titre corresponds to the higher dilution in which the colour changes from red to yellow.—T.E.G.R.

Platt, H. (1959). **The occurrence of pancreatic lesions in adult mice infected with the virus of foot and mouth disease.**—Virology **9**, 484-486. **1773**

White mice of 2 strains (P and G) and C 57/CE hybird mice, all at least 4 months old, were injected i/p with Type O virus passaged 6 times on bovine tongue epithelial cell culture but never in mice. The P and G mice showed no clinical signs of disease but P.M. examination, 1–2 days after inj., revealed pancreatic interstitial oedema in many with a titre of 107 sucking mouse $I.D._{50}$/0·03 g. pancreatic tissue. Histologically, the lesions (confined to the exocrine tissue) varied from minimal interstitial w.b.c. infiltration and oedema to pancreatitis with widespread acinar destruction and profuse macrophage infiltration. In C57/CE mice there was malaise and death (but no paralysis) within 2–9 days. Pancreatic oedema was frequently but not always present and, histologically, there was severe pancreatic necrosis (involving most of the exocrine cells but not the islets of Langerhans) with little or no macrophage or w.b.c. infiltration. Virus titre was 10^8–10^9 sucking mouse $I.D._{50}$/0·03 g. tissue. Skeletal muscles were not affected but the heart muscle fibres were swollen and some of them necrotic. The specificity of these results was checked by the c.f. test. These findings constitute another point of similarity between the behaviour, in mice, of F. & M. disease virus and that of some strains of Coxsackie virus.—T.E.G.R.

I. Sellers, R. F. & Stewart, D. L. (1960). **Factors affecting the formation of plaques by the virus of foot-and-mouth disease on pig kidney monolayer tissue cultures.**—Arch. ges. Virusforsch. **9**, 594-605. [In English.] **1774**

II. Capstick, P. B., Sellers, R. F. & Stewart, D. L. (1960). **The neutralisation of the virus of foot-and-mouth disease by immune serum.** —Ibid. 606-620. [In English.] **1775**

III. Sellers, R. F. (1960). **The growth and antigenicity of the virus of foot-and-mouth disease in pig kidney tissue cultures.**—Ibid. 621-636. [In English.] **1776**

IV. Sellers, R. F., Burt, L. M., Cumming, A. & Stewart, D. L. (1960). **The behaviour of strains of the virus of foot-and-mouth disease in pig, calf, ox and lamb kidney tissue cultures.**—Ibid. 637-646. [In English.] [Authors' summaries modified.] **1777**

I. The number, size and shape of plaques may be affected by : previous history and state of the kidney; cultural conditions during growth of the cells; concentration of cells in the monolayer; washing of cultures before and after addition of the virus; period of adsorption; presence and concentration of neutral red in the overlay; conditions under which the overlay is incubated.

The cell suspension method was found more sensitive in virus detection than the monlayer method but used more cells. Any adverse factors tended to depress to a greater extent the plaque count and plaque size of viruses less adapted to pig kidney tissue culture than of those well adapted.

II. The rate of virus neutralization was determined at various temperatures and was found to be a first order reaction over the first part, although later further interaction between antiserum and virus appeared to take place. The time for attainment of constant virus survival varied with the temp. and with the initial conc. of the reactants. It is suggested that neutralization should be carried out for 90 min. at 37°C., 4 hours at 26°C. or 24 hours at 4°C.

The effect on virus survival of varying the concentration of virus and antiserum was examined. It is suggested that the antibody titre of a serum be defined as the final dilution of antiserum, which after incubation for 24 hours at 4°C. reduces the virus survival to 37% when freshly prepared virus titre of 250–500 plaque-forming units per ml. is used.

Comparison of the plaque method and inoculation of unweaned mice showed that the titre by mouse inoculation was higher. In the mouse test a tenfold increase in serum concentration increased the virus neutralized by tenfold, whereas in the plaque test an approximate threefold increase in serum concentration gave a tenfold increase in virus neutralized.

III. Growth and antigenicity of four culture strains of the virus of F. & M. disease was followed in pig kidney monolayer tissue cultures.

Cultured virus was inactivated by adsorption on to aluminium hydroxide and treatment with 0·05% formalin for 4 days at 26°C. The vaccine thus produced stimulated the production of antibodies and protected g.pigs from generalization when challenged with homologous culture virus. The optimum time of culture harvest varied between 18 and 42 hours. It was found that the vaccine could be diluted and still protect g.pigs, and a potency test for a vaccine is tentatively suggested.

IV. Cattle and kidney strains of the virus multiplied well in the cultures with cytopathic effect, but mouse and egg adapted strains did not multiply or show cytopathic effect to the same extent especially in ox and calf kidneys, and this could be correlated with their behaviour in cattle, pigs and cattle tongue epithelium tissue cultures. All the strains used produced plaques on pig kidney monolayers, but the size and shape of the plaque varied as well as the relation of plaque titre to the titre in mice. The relative number of the different plaque sizes varied with the source of the virus and changed in passage in the different systems. The possible significance of these findings in relation to vaccine preparation and adaptation of the virus is discussed.

Girard, H. C., Choonpicharna, P., Smitinondana, P., Charutamra, U., Supavilai, P., Punyaoopapatt, S. & Longswasdi, P. (1959). Passages en série du virus aphteux Asia 1. **[Serial passages with Asia 1 foot and mouth disease virus.]**—Bull. Off. int. Epiz. **51,** 361-368. [In English pp. 369-375. Summary in Spanish.] **1778**

Virus isolated in Thailand was passaged 8 times in cattle. Thereafter it was used for the production of virus and passaged many times without undergoing any change. Passage in buffaloes was difficult. In sheep, goats and pigs susceptibility to the virus was irregular. In g.pigs passage was achieved with a strain of bovine origin; an old g.pig-adapted strain did not give satisfactory results. The virus was also titrated and passaged in mice. The infection caused by the virus was characterized by its slow development : 5–7 days in cattle and mice, and 7–10 in buffaloes. This implies longer quarantine in infected areas and a longer period of observation (about 2 days) when testing vaccines on lab. animals. For potency tests younger mice (4 instead of 7 days old) have to be used.—T.E.G.R.

Mussgay, M. (1959). Über den Mechanismus der pH-Inaktivierung des Virus der Maul- und Klauenseuche. Vorläufige Mitteilung. **[Mechanism of inactivation by acid of the**

virus of foot and mouth disease.]—Mh. Tierheilk. **11,** 185-190. **1779**

The following theory for F. & M. disease virus inactivation in an acid medium is put forward: in an acid medium the virus disintegrates, infectious ribonucleic acid is freed and immediately inactivated by free cell ribonuclease, provided the virus is contained in tissue or the suspension has not been purified. —E.G.

Petrenko, B. G., Andreev, E. V., Rotov, V. I., Novikov, G. P. & Primak, O. A. (1959). **[Immunization of pigs against experimental foot and mouth disease.]**—Nauch. Trud. Ukrain. Inst. eksp. Vet. **25,** 103-110. [In Russian.] **1780**

The authors compared the VIEV adsorbed formolized vaccine described by Ratner & Gribanov [*Veterinariya* No.9, p.33 (1954)] and the UIEV vaccine, a 20% suspension of tissue from lung, heart, spleen, liver, kidney and bone marrow inactivated by crystal violet and heat. Pigs weighing 30–75 kg. were inoculated with the vaccines by various routes and were challenged with virulent virus of the same type between 16 and 52 days later. Only the UIEV vaccine (two 10 ml. doses inj. s/c a week apart) protected the pigs. Only small numbers of pigs were used and the results were taken to indicate that the UIEV vaccine was worth a more extensive trial.—R.M.

Garbe, H. G., Hussong, H. J., Pilz, W. (1959). Ein Beitrag zur Kasuistik der Maul- und Klauenseuche des Menschen. **[Foot and mouth disease in man.]**—Vet.-med. Nachr. No. 3 pp. 136-141. **1781**

An animal attendant at a foot and mouth disease research station developed vesicles on the hands and erosions on the tongue a few days after working with Type C of the virus. A strain of Type C was isolated from the vesicles and antibodies against the same Type were demonstrated in the blood serum. A keratoma of the palm of the hand is thought to have assisted the entry of the virus. —M.G.G.

Janowski, H. (1959). Przypadki choroby Aujeszky'ego u świń. **[Aujeszky's disease in pigs.]**—Med. Wet., Warszawa **15,** 741-745. [In Polish. Summaries in English and Russian.] **1782**

In an outbreak in pigs weighing 25–50 kg., the symptoms were inappetence, thirst, pyrexia in some, dyspnoea, foaming at the nostrils, clonic spasms, ataxia, and grinding of teeth. Mortality was about 4%. P.M. examination revealed in most cases pulmonary oedema with subpleural ecchymoses and foamy exudate in the trachea and bronchi, hyperaemia of the pharyngeal and laryngeal mucous membranes, and gastro-enteritis. *Salmonella cholerae-suis* was recovered from one pig but otherwise bacteriological examinations proved negative. Lesions of non-suppurative encephalitis were seen in the brain. Rabbits and g.pigs inoculated s/c and i/m with suspension of pigs' brain died, while rats and pigs (susceptible and immune to swine fever) developed only a transient illness. There was no evidence of pruritus in any of the field or the experimental cases. —M. Gitter.

Kersting, G., v. Kerékjártó, B. (1959). Zur experimentellen Pathologie der Aujeszkyschen Krankheit und der B-Virusinfektion (unter besonderer Berücksichtigung der primären Parenchymläsion. **[Experimental pathology of Aujeszky's disease and infection with virus B, with special regard to primary parenchymatous lesions.]**—Arch. exp. VetMed. **13,** 308-317. **1783**

Eight monkeys infected intracerebrally with upwards of 1,000 tissue culture $I.D._{50}$ of Aujeszky's disease virus, 4 rabbits infected intracerebrally and 4 intradermally, all died or were killed when moribund. All gave the same clinical picture, but in rabbits the incubation period and course of illness were much shorter. Histologically the c.n.s. revealed the characteristic cell inclusions in basal nuclei and at the bases of frontal and temporal lobes, but in the rabbits lesions were more definite in hippocampus, medulla oblongata and spinal cord. Inflammatory changes were only secondary.—W. K. Dunscombe.

Kojnok, J., Oláh, P., Surján, J. (1959). Adatok a sertések endemiás tüdögyulladásának kóroktanához. **[Aujeszky's virus in the aetiology of porcine enzootic pneumonia.]**—Mag. állator. Lapja **14,** 262-266. [In Hungarian. Summaries in English and Russian.] **1784**

An account of observations on several hundred pigs affected with enzootic pneumonia. The aetiological factors involved, clinical symptoms, P.M. findings, methods and success of treatment and bacteriological findings are discussed and experimental transmission of the disease described. Aujeszky's disease virus and pasteurella were isolated

from the lungs, brain or blood of a large proportion of the animals examined.

Pigs weighing 40–50 kg. were infected by the trachea with suspensions of pasteurella and/or tissue culture containing the Aujeszky's virus. Nine of 10 pigs infected with the virus suspension in doses from 2–15 ml. developed typical virus pneumonia. All 8 pigs which were infected with a mixture of the virus and pasteurella died or showed the symptoms of pneumonia. 9 pigs of these two groups also showed nervous symptoms. All 4 pigs infected with pasteurella alone, and all 6 controls which received sterile tissue suspension or saline remained healthy.

It is stated that infection with the virus suspension was successfully prevented with Aujeszky serum in further experiments [no details given].

On the basis of their observations the authors incriminate the Aujeszky virus in the aetiology of porcine enzootic pneumonia and suggest the use of oxytetracycline (10 mg./kg., i/m) for the treatment of this disease.

—A. Sebesteny.

Ustenko, V. S. (1958). **[Survival of the virus of Aujeszky's disease in the external environment.]**—Trudy Vsesoyuz. Inst. vet. Sanit. i Ektoparasit. **13,** 49-59. [In Russian.] **1785**

On a wooden surface indoors the virus lived 14–37 days depending on temperature and humidity; out of doors 20–38 days. Survival decreased in the presence of dung. On rabbit skin pickled in brine it survived for 24–28 days. In the muscle of carcasses it lived for 11–18 days at summer temp. and 21–36 days at spring temp.—R.M.

Deilles, E., Chevrier, L. (1959). Méthode pratique de coloration des coupes de cornes d'Ammon permettant une recherche facile des corps de Négri. **[Practical method of staining hippocampus sections for the detection of Negri bodies.]**—Rec. Méd. vét. **135,** 531-542. [Summaries in English and Spanish.] **1786**

The sections are stained for 10 sec. with 1% aqueous alcoholic soln. of basic fuchsine and washed; they are stained for 10 sec. with 1% aqueous alcoholic soln. of methylene blue, washed again and treated with 1·5% aqueous soln. of chromic acid. The cytoplasm of nerve cells is violet blue and the nuclei much lighter; the nucleoli appear blue, black or dark violet; Negri bodies are red or crimson. With this method, as a rule, the smaller the Negri bodies the more intense is the stain.—T.E.G.R.

Etchebarne, M., Bernal, P. G., Leyton, G. R. (1960). **Purification of rabies antibodies in horse serum and diagnostic importance of the fluorescent antibody technique.**—J. Immunol. **84,** 6-10. [Authors' summary modified.] **1787**

Purified horse rabies antibody has been prepared by the isoelectric fractional alcohol precipitation method of Nichol & Deutsch (1948) with a yield of 54%. Neutralizing antibody in the final preparation is mainly in the gamma-2 globulin.

Modifications of the method of Coons were used for conjugating the purified anti-rabies horse antibody with fluorescein isocyanate. Staining of brain smears from rabies-infected dogs and mice with fluorescent antibody showed the diagnostic usefulness of this method.

Huygelen, C., Mortelmans, J. (1959). **Quantitative determination of the dissemination of Flury rabies virus in the central nervous system of the guinea-pig after intramuscular inoculation in the hind leg.**—Antonie v. Leeuwenhoek J. Microbiol. **25,** 265-271. [In English.] **1788**

The authors demonstrated that the virus first multiplied in the lumbo-sacral cord and afterwards spread towards the brain. The concentration of virus was higher in the spinal cord than in the brain before and after the appearance of paralysis.—R.M.

I. Piskareva, N. A., Pisareva, N. A., Ivanov, N. P. (1959). **[Inactivation of rabies virus by ultra-violet light. I. Factors influencing inactivation of fixed virus.]**—Voprosy Virusologii **4,** 420-424. [In Russian. Summary in English.] **1789**

II. Piskareva, N. A., Ivanov, N. P., Pisareva, N. A. (1959). **[Inactivation of rabies virus by ultra-violet light. II. Immunogenic and antigenic properties of inactivated vaccine.]**—Voprosy Virusologii **4,** 615-618. [In Russian. Summary in English.] **1790**

I. An irradiation apparatus was described (with a diagram). It consisted of a revolving horizontal glass disk, 100 mm. diam., driven by electric motor, placed underneath an ultra-violet lamp. Live fixed virus in a 5% suspension of rabbit brain plus 10% sucrose was delivered through a small nozzle to the centre of the disk. Centrifugal force gradually displaced the fluid towards the outside of the disk, where it dripped off into a collecting dish. Tests of the product on mice showed that optimum flow through the apparatus was 3·6

litres an hour. No chemical preservative was required.

II. Tests on rabbits and mice indicated that the vaccine was better than that prepared by Fermi's method. It retained its immunogenic properties after storage for a year at 18° to 25°C. It was tested for safety and immunogenicity on five human beings.

—R.M.

Bugyaki, L. (1959). La survie du virus fixe de Pasteur dans le vaccin antirabique phéniqué type Fermi-Semple et sa relation avec le degré d'immunité conférée. **[Survival of the Pasteur fixed rabies virus in phenolized Fermi-Semple vaccine and its relation to immunogenicity.]**—Ann. Soc. belge Méd. trop. **39,** 275-280. [In French. Summaries in English, German, Spanish and Flemish.] **1791**

An account of experiments on mice with (a) phenolized antirabies vaccine; (b) non-phenolized vaccine held at −25°C. Fixed virus from the Pasteur institute (Paris) was used and both vaccines were 5% sheep brain emulsion, the Semple type having 1% phenol added. Results: (a) the conditions under which the vaccine was kept varied but holding 24 hours at ambient temp. and then in the refrigerator caused a very marked loss of titre; (b) there was a progressive fall in the titre of living virus and in immunizing power. B. concluded that antirabies immunity (as estimated by Habel's method) is related to the presence of living virus and to its amount, and asks whether as a result the use of phenolized vaccine should not be discontinued and only fixed virus used, which if freeze-dried, would make a stable and uniform vaccine available which would have only a small sheep brain content and would therefore be better tolerated.—W. K. Dunscombe.

Baczyński, Z. (1959). Zasady miareczkowania wirusa wścieklizny oraz szczepionek przeciwko wściekliźnie. **[Titration of rabies virus and vaccines.]**—Med. Wet., Warszawa **15,** 653-657. [In Polish.] **1792**

B. described 3 methods of titration and considered the method of Habel, using white mice, to be most suitable and economical. The method of Béquignon & Vialat, using adult rabbits, takes longer and is considered too expensive; with the method used by the U.S. National Institute of Health, which is very accurate, a standardized vaccine is necessary.

—M. Gitter.

Ştirbu, A., Stoian, I. (1959). Protection contre la rage conférée aux animaux par la vaccination antirabique de rappel. **[Booster injections of vaccine against rabies in animals.]**—Arch. roum. Path. exp. Microbiol. **18,** 405-417. [In French. Summaries in English, German and Russian.] **1793**

Three groups of mice were given in 12 days 6 i/p doses of rabies vaccine prepared from a 5% suspension of infected sheep brain. After a week two of these groups received 2 booster doses 2 days apart, and a week later one group received 2 more booster doses. Intracerebral challenge 2–6 days after immunization revealed protection indices of 3,163, 7,080 and 13,490 LD_{50} in the 3 groups respectively. Good immunity to intracerebral challenge developed in 45 sheep given 2 daily doses of vaccine, one i/m and one i/p, for 20 days, followed after 14 days, by booster injections for 6 days in 30 sheep, and 14 days later by a second series of booster doses in 15 sheep. All of 5 sheep resisted 100 LD_{50} intracerebrally 2 weeks after the first series of booster doses, whereas 5 controls died, and 7 of 10 sheep survived intracerebral infection with 1,514 or 15,140 LD_{50} 2 weeks after the second series of booster doses compared with one of 10 controls.—M.G.G.

Zioło, T. (1959). Zmiany morfologiczne w nadnerczach owiec zakażonych ustalonym wirusem wścieklizny (virus fixe szczep Pasteura). **[Morphological changes in the adrenals of sheep infected with fixed rabies virus.]**—Med. Wet., Warszawa **15,** 630-635. [In Polish.] **1794**

Adrenals of yearling sheep infected with fixed rabies virus showed various morphological changes: a preponderance of light over dark staining cells in all layers of the cortex; all layers of the cortex were better differentiated; uniform appearance of the zona fasciculata and increased chromatophilic property of the medullary cells. Z. considers that these changes reflect the activity of the adrenals in sheep with rabies—M. Gitter.

Bindrich, H., Olechnowitz, A. F. (1959). Untersuchungen über die Einwirkung von Hyaluronidase auf das Virus der Tollwut bei Hunden. **[Action of hyaluronidase on rabies virus in dogs.]**—Arch. exp. VetMed. **13,** 523-537. **1795**

Hyaluronidase added to rabies street virus suspensions appeared to have no effect on the course of subsequent infection in dogs, but enhanced the pathogenicity for dogs of mouse-brain fixed Pitman-Moore strains. Egg-adapted Flury strain with hyaluronidase,

when injected into the neck muscles of dogs, produced clin. symptoms resembling those of classical rabies, but the dogs recovered.—E.G.

Plowright, W., MacLeod, W. G., Ferris, R. D. (1959). **The pathogenesis of sheep pox in the skin of sheep.**—J. comp. Path. **69,** 400-413. **1795**

The effects were studied of intradermal inoculation of sheep pox virus in African and Merino sheep. Tissue culture titration of material taken at intervals from the lesions revealed an eclipse phase in 3 out of 4 animals, followed by an increase in titre to a peak on the 7th to 8th days which persisted to the 14th day and then gradually declined. Histologically the lesion was a coagulative necrosis associated with vascular thrombosis, the main changes appearing in the subepithelial tissues. Daily haematological examination revealed slight leucocytosis and eosinopenia.

—W. E. Parish.

Bauer, D. J., Sheffield, F. W. (1959). **Antiviral chemotherapeutic activity of isatin β-thiosemicarbazone in mice infected with rabbit-pox virus.**—Nature, Lond. Suppl. No. 19 pp. 1496-1497. **1797**

The compound gave complete protection to mice against infection with rabbit pox virus. Both rabbit pox and vaccinia are highly sensitive to the compound; ectromelia is resistant.

—E.V.L.

Fernandez, C. G. (1960). **Persistence of herpes simplex virus in HeLa cells.**—Nature, Lond. **185,** 268. **1798**

The *HFEM* strain of herpes virus in monolayer culture of HeLa cells produced an extensive cytopathic effect. Isolated cells sometimes survived and if medium containing antiviral serum was added they developed into colonies and, eventually, into a large population; they were apparently healthy and grew as well as the original HeLa cells from which they did not differ morphologically. Despite continued growth in the presence of high-titre antiserum virus was recoverable (for at least nine months involving 29 sub-cultures) from microscopic foci of infected cells or plaques, which appeared irrespective of whether or not the medium contained antiserum. If antiserum was present they remained localized and did not increase in number. There was one plaque forming unit in approximately 10^5 cells. On removal of the antiserum from the medium the foci became larger and confluent and virus was released into the medium. Virus was not isolated from medium or cells when no plaques were visible. A sub-line of virus-free cells was grown from recovered cells and compared with the original HeLa cells for susceptibility to virus recovered from a single plaque in the recovered cells and grown in chick cells to form a virus stock. A large dose of virus (10–100 times that required to infect HeLa cells) caused a confluent cytopathic effect with release of virus. The mechanism of persistence of herpes virus in HeLa cells is discussed.

—T.E.G.R.

Fauconnier, B. (1959). Variation naturelle du virus grippal de type A vis-à-vis des inhibiteurs sériques des animaux normaux. **[Non-specific inhibitors of haemagglutination by influenza virus in serum from normal domestic animals and monkeys. Differences in inhibition of different strains of virus.]**—Ann. Inst. Pasteur **97,** 377-384. [Summary in English.] **1799**

Serum from normal rabbits, g.pigs, pigs, mice, cattle, horses, fowls, sheep and monkey was tested for haemagglutination inhibition of 17 strains of influenza virus (types A. B and D selected according to the date of their isolation). Inhibitors were not demonstrable for the 6 strains of type B. Type A viruses fell into 3 chronological groups. During 1933–1945 the strains were of the classical type A, inhibited by rabbit and by g.pig serum at a low titre. During 1946–1956 they were of the type A1, inhibited by ox and sheep serum. In 1957 the Asian strain (A/Asian/57) made its appearance, inhibitors being found in g.pig, fowl and horse serum. In the last 2 groups inhibition sometimes occurred at very high titres. Monkey serum contained no inhibitors for any of the 17 strains tested. Inhibition titres of the third group were increased by heating the serum at 60°C. for 1 hour.

—T.E.G.R.

Fraňo, J., Hanicko, L. (1959). Vírus chrípky A anatis "Košice 1956", isolovaný z respiratórneho ochorenia káčeniec. III. Porovnávacia štúdia adsorpčno-elučnej schopnosti. **[Influenza A anatis, strain "Košice 1956" isolated from ducks. III. Comparative adsorption-elution studies.]**—Vet. Čas. **8,** 545-555. [In Slovak. Summaries in English, French, German and Russian.] **1800**

Adsorption and elution characteristics of the virus previously described [*V.B.* **29,** 2088 & 3846] were compared with those of influenza viruses PR8 and A_1 FM_1. At pH 7–8 adsorption was about the same for all

three strains. At lower pH adsorption of all three was greatly reduced. Alkaline environment appeared to affect each strain differently. Spontaneous elution was observed in all three strains, the highest rate in PR8 strain. At pH below 4·5 elution was non-specific. Photocolorimetry was regarded as more suitable for the evaluation of the haemagglutination activity than the sedimentation method.—E.G.

Melander, B. (1960). **N^1, N^1-anhydrobis-(β-hydroxyethyl) biguanide-hydrochloride (AB OB) in prophylaxis and suppression of experimental influenza.**—Antibiot. & Chemother. **10,** 34-45. [Summary in Spanish. p. 64. Authors' summary modified.] **1801**

In the search for an agent for prophylaxis and suppression of clinical influenza, a series of biguanides have been screened against mouse-adapted influenza, PR8 and Lee I strains.

Both conventional intranasal technique and a new method utilizing aerosolized influenza suspensions have been employed.

The compound ABOB combined with methatropine nitrate and methscopolamine nitrate minimized the degree of consolidation of the mouse lungs harvested on the fourth or fifth day after inoculation. Significant effect was observed when the combination was given prophylactically and as a suppressant.

I. Buescher, E. L., Scherer, W. F., Rosenberg, M. Z., McClure, H. E. (1959). **Immunologic studies of Japanese encephalitis virus in Japan. III. Infection and antibody responses of birds.**—J. Immunol. **83,** 605-613. **1802**

II. Buescher, E. L., Scherer, W. F., Rosenberg, M. Z., Kutner, L. J., McClure, H. E. (1959). **Immunologic studies of Japanese encephalitis virus in Japan. IV. Maternal antibody in birds.**—**Ibid.** 614-619. **1803**

I. Previous work had shown that night herons and egrets were susceptible to infection with Japanese B encephalitis virus. The present study concerned the time of onset and duration of viraemia and the immune response to artificial infection in these wild birds and also in fowls.

II. Maternal antibodies reacting with JE virus were found in newly-hatched domestic chicks and wild birds near Tokyo. Maternal neutralizing antibody in chicks prevented viraemia upon challenge with JE virus, but did not affect viraemia from WEE virus.—R.M.

Scherer, W. F., Moyer, J. T., Izumi, T. (1959). **Immunologic studies of Japanese encephalitis virus in Japan. V. Maternal antibodies, antibody responses and viremia following infection of swine.**—J. Immunol. **83,** 620-626. [Authors' summary modified.] **1804**

Antibodies to JE virus of maternal origin were found in pigs 2–7 months of age near Tokyo. These passively acquired antibodies were detected most frequently by the neutralization test, less often by haemagglutination-inhibition and never by complement fixation. Detectable maternal antibodies disappeared in the majority of pigs by 4–6 months of age at which time pigs became susceptible to virus.

HI and neutralizing antibodies developed regularly within 1–4 weeks of natural or experimental swine infection by JE virus, but c.f. antibodies formed in only 11 of 61 pigs infected naturally at farms and in only two of four pigs after s/c inoculation of virus at the laboratory. Although the neutralization test was most sensitive for detection of maternal antibody, the HI test proved best for evaluating recent infection where no other virus of the arthropod-borne Group B was endemic.

Viraemia was demonstrated following natural infection of pigs in mosquito traps. After s/c inoculation of JE virus at the laboratory, virus was found in blood for 4 days.

I. von Zeipel, G., Svedmyr, A., Zetterberg, B. (1959). **The geographical distribution in Sweden of viruses belonging to the Russian spring-summer–louping ill group. I. Serological survey of antibodies in cow sera.**—Arch. ges. Virusforsch. **9,** 449-459. [In English.] **1805**

II. von Zeipel, G. (1959). **Isolation of viruses of the Russian spring-summer encephalitis–louping-ill group from Swedish ticks and from a human case of meningoencephalitis.**—Ibid. 460-469. [In English.] **1806**

I. In Sweden antibodies neutralizing louping-ill virus were demonstrated in serum samples from cows, particularly in the south-east, geographical distribution coinciding with that of ticks and Russian spring summer encephalitis antibodies in serum from man with meningoencephalomyelitis.

II. Five strains of viruses belonging to the Russian spring-summer—louping ill group were isolated in mice, four of them from ticks in the Stockholm area, the fifth from the serum of a person with acute meningoence-

phalitis. Details were given of c.f. tests, and virus neutralization in mice and tissue culture. —E.G.

Surdan, C., Cure, C., Dumitriu, E., Wegener, M. (1959). **Investigations concerning the relationship of silver fox virus encephalitis to infectious canine hepatitis of Rubarth.**—Acta virol., Prague **3,** 115-124. [In English.] **1807**

In Roumania the viruses of encephalitis in silver foxes and canine hepatitis caused similar clin. symptoms and P.M. lesions in foxes, and were identical immunologically in cross immunity tests in puppies. Both viruses were incorporated in an adsorbed vaccine that has given good results in 500 silver foxes and 3,000 dogs. It was demonstrated that canine virus hepatitis can be transmitted by rabies vaccine prepared from the brain of infected dogs.—M.G.G.

Hull, R. N., Nash, J. C. (1960). **Immunization against B virus infection. I. Preparation of an experimental vaccine.**—Amer. J. Hyg. **71,** 15-28. [Authors' summary modified.] **1808**

A formaldehyde-inactivated B virus vaccine consistently passed extensive tissue culture and rabbit safety tests. It produced antibodies in rabbits, g.pigs and monkeys. and protected rabbits against direct challenge with live B virus. Viraemia in rabbits was demonstrated on the second day after s/c injection of live virus. Serum antibody studies of monkeys immediately after capture in India indicated that the incidence of contact with B virus was 10% as compared with 60 to 70% in lab. colonies.

Oleiňik, N. K., Malyarets, P. V. (1959). [**Diagnosis of equine infectious anaemia by means of an anaphylactic test on guinea-pigs.**] —Nauch. Trud. Ukrain. Inst. eksp. Vet. **25,** 153-160. [In Russian.] **1809**

The reaction of anaphylaxis with desensitization originally described by Zil'ber has been applied to the diagnosis of swine fever [*V.B.* **29,** 2813]. The present authors used the same reaction in g.pigs with serum from 9 horses with infectious anaemia and claimed accurate diagnostic results.—R.M.

Oleiňik, N. K. (1959). [**Electron microscopy of blood from horses with infectious anaemia.**]—Nauch. Trud. Ukrain. Inst. eksp. Vet. **25,** 139-151. [In Russian.] **1810**

Specific bodies up to 50 mμ in diameter were detected on the stroma of haemolysed erythrocytes and in eluate of erythrocytes from 4 experimentally infected foals and 2 spontaneously infected horses. [10 illustrations.]—R.M.

Hoffmann, G. (1959). Elektronenmikroskopische Untersuchungen über die feingeweblichen Veränderungen bei der infektiösen Anämie der Pferde. I. Mitteilung: Befunde am Zytoplasma der Leberzelle. [**Electron microscopy of lesions in equine infectious anaemia. I. Changes in the cytoplasm of liver cells.**]—Arch. exp. VetMed. **13,** 953-963. **1811**

H. described specific changes in the cytoplasm of liver cells from infected horses. Fixation and staining techniques were described and 8 photomicrographs were reproduced.—R.M.

Nakamura, R., Sonoda, M., Too, K., Kagota, K., Kobayashi, K., Ohshima, K. (1959). **Therapeutic treatment in equine infectious anemia. VI. The use of Greenpole, Resochin and Pans-No. 610 for horses artificially and naturally affected with infectious anemia.**—Jap. J. vet. Res. **7,** 104-114. [In English.] **1812**

Greenpole (sodium-iron-chlorophyllin), Resochin (chloroquine diphosphate) and Pans No. 610 (a sulphonamide) had no therapeutic value in equine infectious anaemia.—T.E.G.R.

Khera, K. S., (1958). Étude histologique de la peste bovine. I. Pathogénèse du virus de la peste bovine dans les ganglions lymphatiques. II. Lésions histologiques au niveau du tractus digestif. III. Lésions dans les différents organes. [**Histological studies of rinderpest. I. Pathogenesis of the virus in lymph nodes. II. Microscopic lesions in the digestive tract. III. Lesions in other organs.**]—Rev. Élev. **11,** 399-405; 406-415 & 416-420. [Summaries in English and Spanish.] **1813**

1. In 16 experimentally infected bulls reticular hyperplasia was the first change followed, in the lymph follicles, by necrosis of the reticulum and reticular cells; the reticulum was replaced by fine, non-argyrophilic fibrils and the lymph node presented a "washed out" appearance. In diffuse lymphatic tissue hyperplasia was followed by differentiation into reticular histiocytes, macrophages and giant cells. Necrosis of phagocytes and lymphocytes and degeneration of the reticular fibres and cells occurred 8 days after infection. Towards the final stage of infection capillary sprouting occurred in the lymph nodes, which

showed signs of developing fibroblasts and focal lymphocytic regeneration.

II. In the mouth and pharynx there was necrosis of the epithelium (followed by polymorphonuclear infiltration) exposing the basal Malpighian layer and, less commonly, the papillary body. Acidophile inclusions were also observed in the ballooned cells, particularly of the pharynx. Lesions in the abomasal mucosa were infarcts or liquefactive necrosis followed by fibrinous exudate on the surface. In the small intestine there was invagination of the crypts of Lieberkühn through the muscularis mucosae in Peyer's patches, forming cystic dilatations which degenerated into necrotic masses which later communicated with the lumen. In the lymphoid follicles there was necrosis with evacuation of the cellular debris into the intestinal lumen through a channel which developed 5 days after infection. Deep and shallow ulcers occurred in the large intestine.

III. In the spleen there was hyperplasia of the reticular cells of the Malpighian follicle, followed by necrosis and lymphorrhexis, the follicle being reduced to a halo around its central arteriole. In the liver there was oedematous swelling of the parenchyma cells, small necrotic foci and, in some cases, inspissated bile in the ducts and canaliculi. There was cloudy swelling of the kidneys, congestion in the heart and brain, and degeneration and intense focal congestion in the marrow of long bones.—T.E.G.R.

Scott, G. R., DeTray, D. E., White, G. (1959). **A preliminary note on the susceptibility of pigs of European origin to rinderpest.**—Bull. Off. inst. Epiz. **51,** 694-698. [In English.] **1814**

Young purebred Large White pigs reared in Kenya from stock originating in Europe could be infected with rinderpest virus by subcutaneous inoculation and by being fed infected animal tissues; and susceptible pigs and East African short-horned zebu × European cattle could be infected by contact with these infected pigs. The majority of infections were clinically unrecognizable as rinderpest and many were clinically inapparent. Rinderpest must be eradicated before the export of meat can be allowed from rinderpest enzootic areas.—A. Ackroyd.

Netter, R. (1959). Préparation du virus vaccin bovipestique lapinisé lyophilisé. Intérêt de l'emploi de la peptone comme solvant. [**Use of peptone in preparation of lapinized rinderpest vaccine.**]—Bull. Off. int. Epiz. **51,** 704-709. **1815**

Of the substances tested peptone (5·5%) gave the best results as a preservative. The vaccine retained its efficacy for 9–14 days at 45°C. and 18–21 days at 37°. Buffaloes injected with 1/40 vaccinal dose resisted challenge 12 days later.—T.E.G.R.

Nguyen-Ba-Luong, Nguyen-Van-Liem, Nguyen-Ngoc-Minh, Vu-Thien-Thai. (1959). Essais d'amélioration des méthodes de conservation du virus-vaccin pestique lapinisé. [**Preservation of lapinized rinderpest vaccine.**]—Bull. Off. int. Epiz. **51,** 665-680. [Summaries in English and Spanish.] **1816**

The vaccine was freeze-dried and its efficacy at a titre of 10^{-4} was tested at temperatures from −14° to 37°C. At −14°C. it survived for over 2 months. Recommendations are made for storage, for transport and for use in the field.—T.E.G.R.

Huygelen, C. (1960). Runderpestvirus in weefselkultuur. [**Tissue culture of rinderpest virus.**]—Vlaams diergeneesk. Tijdschr. **29,** 46-53. [In Flemish. Summaries in English, French and German. English summary modified.] **1817**

The method employed for the propagation of rinderpest virus in monolayers of bovine testicle cells, is described in detail. The virus used was the Kabete "O" strain, which had been adapted to growth in bovine kidney cell cultures by Plowright & Ferris and passaged 64 times on these cells.

McKercher, D. G., Straub, O. C., Saito, J. K., Wada, E. M. (1959). **Comparative studies of the etiological agents of infectious bovine rhinotracheitis and infectious pustular vulvovaginitis.**—Canad. J. comp. Med. **23,** 320-328. **1818**

Experimental infections in heifers, tissue culture, and cross-neutralization tests with viruses from bovine rhinotracheitis in Colorado and bovine pustular vulvo-vaginitis in New York confirmed the findings of Gillespie and others [*V.B.* **30,** 117] that the two diseases were caused by the same virus.

—R. V. L. Walker.

Bakos, K., Dinter, Z. (1960). **Identification of a bovine mucosal-disease virus isolated in Sweden as Myxovirus para-influenzae 3.**—Nature, Lond. **185,** 549-550. **1819**

A cytopathic agent was isolated in calf kidney tissue culture from an outbreak of a mucosal-like disease.

The isolated agent passed "Gradocol" membranes with an average pore diameter of 240 mμ and when injected into calves produced a mild form of the disease; it agglutinated g.pig and fowl r.b.c. A serological relationship to the HA-1 strain of para-influenza 3 virus was demonstrated by haemadsorption inhibition, H.I. and neutralization tests.

Abinanti, F. R., Byrne, R. J., Watson, R. L., Poelma, L. J., Lucas, F. R., Huebner, R. J. (1960). **Observations on infections of cattle with Myxovirus parainfluenzae 3.**—Amer. J. Hyg. **71,** 52-58. [Authors' summary modified.] **1820**

Fifteen isolations of para-influenza 3 virus were made from 1957 to 1959 from the nasal secretions and lung tissue of calves and older cattle with respiratory disease. The virus was also recovered 3 times from the nasal secretions of apparently normal calves at two abattoirs. Serological evidence of infection was also demonstrated in some of these animals The importance of these observations in relation to human para-influenza 3 infections must still be determined.

Plowright, W., Witcomb, M. A. (1959). **The growth in tissue cultures of a virus derived from lumpy-skin disease of cattle.**—J. Path. Bact. **78,** 397-407. [Authors' summary modified.] **1821**

A virus derived from lumpy-skin disease of cattle grew readily in cultures of cells derived from calf and embryonic sheep kidneys and calf and lamb testes.

The infections were at first always focal, but dissemination of the virus from cell to cell occurred more extensively and rapidly in sheep testicle cells; this was associated with higher and often earlier peak titres.

For all culture types investigated a persistent virus fraction was demonstrable in the cells throughout the "eclipse" period. After virus proliferation became demonstrable the titre of virus free in the fluid was always lower than that in the cells, even in advanced stages of the infection, when the difference was usually of the order of 1 log. unit.

Growth of the virus was correlated with the progression of its cytopathic effect and a description is given of the cytological changes in stained infected cultures, with special reference to the cytoplasmic inclusions.

The cultural behaviour of the virus is similar to that of sheep pox and other mammalian pox viruses.

Rosenberger, G., Gründer, H.-D. (1959). Untersuchungen über die Immunitätsbildung und Immuntherapie bei der Papillomatose des Rindes. **[Immunity and immunotherapy in bovine papillomatosis.]**—Dtsch. tierärztl. Wschr. **66,** 661-666. [Summary in English.] **1822**

Serum antibodies were demonstrated by virus neutralization following natural or experimental papillomatosis. Immunity of short duration was produced by simultaneous inoculation of virus and immune serum. Immune convalescent serum had no therapeutic effect.—E.G.

Inaba, Y., Omori, T., Kodama, M., Ishii, S., Matumoto, M. (1959). Virus BFI, virus cytopathogénique, isolé à partir de matériaux bovins. Isolement et propriétés; hémagglutination. **[A cytopathic virus isolated from bovine faeces. Isolation and properties; haemagglutination.]**—C. R. Soc. Biol., Paris **153,** 1653-1656; 1669-1672. **1823**

Seven strains of a cytopathic virus were isolated in Japan from the faeces of 6 cattle imported from Australia. Neutralizing antibodies against the virus were found in the blood of these cattle and also in 6 of a group of 49 local cattle, and in 22 of 31 local cattle that had recovered from a respiratory disease. Serum neutralization tests with ECBO virus showed that the 2 viruses were different. It was inactivated by exposure to 60° for 120 min. and 37° for 42 days. Serial passages were made in cells of calf embryo, pig kidney and HeLa cells, and in mice and chick embryos. The infection was symptomless in mice and was not fatal for chick embryos.

In tissue cultures BF1 virus formed haemagglutinin that reacted at 4°C. with erythrocytes of sheep and horses, but not of other animals and birds. The haemagglutinin resisted ultra-violet light, ether, and heating to 65°C. Haemagglutination was inhibited by immune serum from cattle.—M.G.G.

Palmer, A. C. (1960). **Distribution of vacuolated neurons in brains of sheep affected with scrapie.**—J. Neuropath. **19,** 102-110. [Author's summary modified.] **1824**

The frequency and neuro-anatomical distribution of vacuolated nerve cells were studied in 4 sheep affected with scrapie and in 3 apparently healthy sheep. Almost no intracytoplasmic vacuolation was found anterior to the superior colliculus.

In two natural cases of scrapie there was intense vacuolation especially in certain

nuclear masses in the medulla. Vacuolation was less intense in a sheep killed 6 months after experimental transmission of the disease and it was very slight in another killed 6 weeks after transmission.

Only a few vacuolated neurones occurred in the brains of healthy sheep.

Kulesko, I. I., Ageev, I. Y. (1959). **[Electron microscope study of swine fever virus in blood and the diagnostic possibilities of this method.]**—Nauch. Trud. Ukrain. Inst. eksp. Vet. **25,** 111-125. [In Russian.] **1825**

Haemolysed erythrocytes from healthy pigs had a stroma that appeared smooth or slightly rough under the electron microscope. On some there were round or polyhedral shapes of low density, 150–700 mμ in diameter.

On the surface of the stroma of erythrocytes from pigs with swine fever there were spherical bodies 20–44 mμ in diameter. These bodies were not observed in preparations of blood collected before infection. Deposit from filtered serum from infected pigs contained similar round bodies.

It was considered necessary to extend the studies to blood from pigs with paratyphoid, foot and mouth disease, influenza and other infections before the diagnostic significance of the bodies could be assessed.—R.M.

Christov, S. (1959). Étude sur un virus de la peste porcine isolé en Bulgarie. **[Study of a strain of swine fever virus isolated in Bulgaria.]**—Bull. Off. int. Epiz. **51,** 417-431. [Summaries in English and Spanish.] **1826**

The virus isolated from an outbreak of swine fever in Bulgaria in 1956 was more virulent than normal and retained its virulence for 300 days, at −25°C. Results of immunological studies are presented.—T.E.G.R.

Kernkamp, H. C. H. (1960). **The transenteral entrance of the virus in hog choelra.**—J. Amer. vet. med. Ass. **136,** 149-155. **1827**

None of 23 pigs developed swine fever when the virus was introduced into the stomach or small intestine, and only 8 resisted subsequent i/m challenge. But of 30 pigs infected orally, 21 died from swine fever and 9 developed immunity.—M.G.G.

Dobberkau, G. (1959). Histologische Untersuchungen der Haut bei Schweinepest. **[Histology of the skin in swine fever.]**—Arch. exp. VetMed. **13,** 590-615. **1828**

The histology was described of skin from 39 pigs which had died of swine fever and from 6 experimentally infected pigs 15, 24, 36, 65 and 90 hours after infection. Fifteen hours after infection there was infiltration of perivascular connective tissue by eosinophiles; 24 hours after infection serous infiltration of perivascular tissue, swelling of endothelial cell nuclei and of the media of capillaries. Macroscopic haemorrhages were seen on the 6th day and necrosis on the 8th.—E.G.

Janowski, H., Truszczyński, M., Walczak, J. (1959). Dalsze wyniki prób użycia adaptowanego do królików (lapinizomanego) szczepu wirusa pomoru świń do masowych szczepień świń przeciw pomorowi. **[Lapinized swine fever vaccine.]**—Med. Wet., Warszawa **15,** 618-625. [In Polish. Summaries in English and Russian.] **1829**

9,860 pigs (20–50 kg.) kept under various environmental conditions were given simultaneously "Rovac" lapinized vaccine and swine fever serum. Post-vaccination reactions were noted in 3·5% of pigs mainly in those in poor condition and affected with a concurrent, often latent, disease (influenza, salmonellosis, dysentery etc.). There was no evidence of spread of the virus to non-vaccinated pigs in contact. The acquired immunity lasted at least 6 months. On one of 3 farms where the pigs were vaccinated after swine fever had been diagnosed, there were no further deaths after vaccination; on another the post-vaccination losses amounted to 5·3% and on the third, where the suspected animals were not isolated, to 26%.—M. Gitter.

Brinkman, D., Burch, G. R., Sanders, E. F., Newberne, J. W. (1959). **Simultaneous vaccination against hog cholera and swine erysipelas.**—Allied Vet. **30,** 140-142. **1830**

Good immunity was produced against both swine fever and swine erysipelas when pigs were vaccinated simultaneously but at different sites with a live, avirulent swine fever vaccine and a killed *E. rhusiopathiae* vaccine, using separate syringes.—E.V.L.

Larski, Z. (1959). Porównanie wrażliwości świń rasy puławskiej i świń białych zwisłouchych na zakażenie wirusem choroby cieszyńskiej. **[Comparative susceptibility to Teschen disease in two Polish breeds of pigs.]**—Med. Wet., Warszawa **15,** 693-695. [In Polish. Summaries in English and Russian.] **1831**

Piglets of Pulawy breed were more susceptible than white pigs to intracerebral inoculation of Teschen disease virus. The difference in susceptibility was not statistically

significant. There was no difference in the course of the disease or histology of the lesions in the affected animals.—M. Gitter.

Murnane, T. G., Craighead, J. E., Mondragon, H., Shelokov, A. (1960). **Fatal disease of swine due to encephalomyocarditis virus.**—Science **131,** 498-499. [Authors' summary modified.] **1832**

Encephalomyocarditis virus was isolated from the organs of pigs dying during an outbreak of an acutely fatal disease on a farm in Panama. The outstanding lesion was severe myocarditis. Pigs inoculated with the viral isolate developed a systemic infection with myocarditis.

Manninger, R., Mészáros, J., Szent-Iványi, T. (1960). **Further investigations on the aetiology of infectious gastro-enteritis of pigs.**—Acta vet. Acad. Sci. hung. **10,** 83-93. [In English.] **1833**

An English account of work previously published [*V.B.* **29,** 2116].

The experiments produced further evidence that a virus is responsible for infectious gastro-enteritis in Hungary. They have failed to support any supposition that an appreciable part is played by vibrios. [See also *V.B.* **19,** 1523.]—R.M.

Karzon, D. T., Bussell, R. H. (1959). **Cytopathic effect of canine distemper virus in tissue culture.**—Science **130,** 1708-1709. [Authors' summary modified.] **1834**

A characteristic cytopathic effect was obtained with distemper virus (Onderstepoort strain) propagated in chick embryo fibroblast monolayers. In limiting dilutions the lesions were focal. The titre at the 20th tissue culture passage was approximately 10^5 TCD_{50}/ml. Cytopathogenicity was specifically inhibited by distemper immune serum. Minute plaques were produced under agar overlay.

Warren, J., Nadel, M. K., Slater, E., Millian, S. J. (1960). **The canine distemper-measles complex. I. Immune response of dogs to canine distemper and measles viruses.**—Amer. J. vet. Res. **21,** 111-119. **1835**

Of 6 dogs that developed moderate antibody titres after s/c inoculation with living, egg-adapted distemper virus, 3 also showed antibody at low titre against measles virus. Challenge with virulent distemper virus caused rises in both distemper and measles antibody in all 6. Little or no antibody against distemper and measles viruses was demonstrated in dogs inoculated s/c or i/p with killed measles virus, but they appeared to be sensitized, since challenge with distemper virus induced good rises in antibody titre against both viruses. Dogs infected with live measles virus showed no symptoms and formed both measles and distemper antibody; 13 of 14 survived infection with virulent distemper virus. This challenge boosted titres of both antibodies. Measles antibody was not demonstrated in 2 ferrets and 4 cats inoculated with the virus. Slight rises in 3 rabbits were considered to be non-specific. The 2 ferrets succumbed to challenge with distemper virus. Dogs immunized with a distemper strain passaged in ferrets had higher c.f. titres with measles antigen than dogs immunized with other strains of distemper virus.—M.G.G.

Rothschild, M. (1960). **Myxomatosis in Britain.**—Nature, Lond. **185,** 257. **1836**

The contrast between the host–vector relationship in myxomatosis in Australia and in the U.K. is discussed.

R. states that further information on the biology of the rabbit flea *(Spilopsyllus cuniculi)* and other possible vectors may reveal that in the U.K. a different set of factors comes into operation between major epidemics. After the initial virulent outbreak in Peterborough, when the rabbit population was at its lowest, individual flea infestation of the survivors caught was (contrary to what might be expected) greatly reduced. In the year before the outbreak all of 500 rabbits examined had fleas (average about 70 per rabbit). Three years later, when the rabbit population was on the increase, rabbit fleas were again plentiful. It is possible that the chief vectors during an epidemic may be different from those between or at the end of epidemics. Mosquitoes and other winged vectors *(Simulium)* are capable of transmitting the disease during the period of reduced rabbit and flea populations.—T.E.G.R.

Marshall, I. D. (1959). **The influence of ambient temperature on the course of myxomatosis in rabbits.**—J. Hyg., Camb. **57,** 484-497. [Author's summary modified.] **1837**

Ambient temperature profoundly affects the mortality rate and symptomatology in rabbits infected with an attenuated Australian strain of myxoma virus. Simulated summer temperatures allowed at least 70% of infected rabbits to recover, whereas only 8% recovered when held at simulated winter temperatures.

Similar fluctuating high temperatures did not reduce the lethality of rabbit pox or of a highly virulent strain of myxoma virus.

Myers, W. L., Fritz, T. E. (1959). **Histopathologic changes in virus enteritis of mink.**—Canad. J. comp. Med. **23,** 246-249. [Summary in French.] **1838**

The clinical similarity of virus enteritis of cats (VEF) and virus enteritis of mink (VEM) has been recorded by numerous investigators and there have been attempts to demonstrate a relationship between the two diseases.

Tissue sections from mink infected with VEM and sections of intestine from mink infected with VEF were examined histologically.

Epithelial cells lining the crypts of the small intestine of mink infected with VEM showed a pronounced swelling which was absent in the same tissue from mink infected with VEF. Inclusion bodies were also present in the epithelial cells of the mucosa of the small intestine of mink infected with VEM, one type being found in the cytoplasm of the swollen epithelial cells and a second type being a granular intranuclear inclusion present in the non-swollen epithelial cells. It is suggested that these inclusion bodies could serve as a diagnostic aid in virus enteritis of mink.

—R. V. L. Walker.

Bang, F. B., Warwick, A. (1959). **Macrophages and mouse hepatitis.**—Virology **9,** 715-717. **1839**

A brief account (with 2 photomicrographs) is given of: (a) selective destruction of mouse macrophages by the virus of mouse hepatitis cultivated in mouse tissue explants on reconstituted collagen; and (b) destruction of liver parenchymal cells after continued passages in tissue culture. In the first passage of the virus the changes observed in the macrophages 2 days after infection progressed to complete destruction of most of the fixed and migrating macrophages within the next day. The changes occurred consistently in 10 serial passages in the liver explant. Macrophages from cultures of spleen, lung and kidney were also selectively destroyed. Although most of the epithelium and fibroblasts, including the liver cords extending out on the collagen substrate, remained intact during virus growth, early macrophage destruction was followed by partial to complete destruction of liver cells in later passages. The normal change in pH in infected cultures did not occur, in most cases owing to extensive destruction. This is believed to be the first instance of selective destruction of these cells by a virus.—T.E.G.R.

v. Sprockhoff, H. (1960). Experimentelle Untersuchungen zur Laboratoriumsdiagnose der atypischen Geflügelpest. [**Laboratory diagnosis of Newcastle disease.**]—Dtsch. tierärztl. Wschr. **67,** 14-17. [Summary in English.] **1840**

Of 188 chick embryos, 9–11 days old, from hens immunized against Newcastle disease, only 2 were resistant to Newcastle disease virus. No antibody was demonstrable in the yolk. No difference in gross lesions and haemagglutination titres were seen between infected chick embryos incubated at 35·5° and at 38°C.—M.G.G.

Schmidt, U. (1959). Über die immunisierende Wirkung des gefriergetrockneten B_1-Geflügelpestvirus. [**Immunizing action of freeze-dried Newcastle disease modified virus.**]—Arch. exp. VetMed. **13,** 982-991 **1841**

Immune response to oral and intranasal application of live, attenuated B_1 strain of Newcastle disease virus in chicks 1–40 days old, was inferior to that produced by s/c inj. of inactivated adsorbed vaccine. Results depended on the age of chicks at vaccination. Optimal response to intranasal vaccination was in chicks between 20–30 days old, optimal response to drinking water vaccine in those up to 30 days old. The number of those succumbing to challenge increased with the age at immunization. After six months, protection afforded by all three methods began to wane, especially in those vaccinated orally. The number of immune chicks yielding negative haemagglutination - inhibition reactions was highest two weeks after vaccination, particularly in very young birds. In a number of chicks serum-neutralization titres were positive at a time when haemagglutination - inhibition was not yet demonstrable. Live virus was recovered from faeces of chicks vaccinated by the oral and intranasal routes.—E.G.

Subramanyam, P., Pomeroy, B. S. (1960). **A comparison of the effects of four strains of Newcastle disease virus on a strain of human epithelial-like cells (Maben) and strain L mouse fibroblasts.**—Amer. J. vet. Res. **21,** 133-137. **1842**

Four strains of Newcastle disease virus

differed in pathogenicity and in titre during 16 passages in epithelial-like cells derived from human lung adenocarcinoma. Cytopathogenicity was correlated with haemagglutination titre, lethal dose for chick embryos and pathogenicity for chickens. The strains did not multiply on initial contact with strain L mouse fibroblast cells.—M.G.G.

Kawakubo, A., Kuba, N., Nakamura, J. (1958). **Studies on infectious bronchitis of chickens. I. Isolation of virus and characters of isolated virus.**—N.I.B.S. Bull. biol. Res., Tokyo **3,** 31-42. [In English.] **1843**

The authors isolated 19 strains of virus from outbreaks of an infectious bronchitis-like disease among chickens in Tokyo and Kanagawa Prefectures between 1951 and 1955. This report deals with some basic properties of one of the strains.—R.M.

Hoekstra, J., Rispens, B. (1960). Infectieuze bronchitis bij pluimvee. I. Laboratoriumexperimenten met een sterkwerkende entstam. **[Avian infectious bronchitis. I. Laboratory experiments with live virus vaccine.]**—Tijdschr. Diergeneesk. **85,** 279-284. [In Dutch. Summaries in English, French and German.] **1844**

Hoekstra, J. (1960). Infectieuze bronchitis bij pluimvee. II. Praktijkervaringen met de sterkwerkende entstof. **[Avian infectious bronchitis. II. Field trials with live virus vaccine.]**—Ibid. 320-330. [In Dutch. Summaries in English, French and German. Authors' summaries modified.] **1845**

I. A Dutch strain of infectious bronchitis virus was attenuated by 52 preliminary egg-passages. The vaccination strain constantly produced high I.B. serum-titres in chicks and in adult fowls.

II. Under field conditions the vaccine showed excellent immunizing properties but was too pathogenic for certain flocks of young chicks.

Mason, D. M. (1959). **A capillary tube agglutination test for detecting antibodies against ornithosis in turkey serum.**—J. Immunol. **83,** 661-666. [Author's summary modified.] **1846**

A capillary tube agglutination test using a Giemsa-stained, buffered suspension of elementary bodies prepared from a toxigenic turkey strain of psittacosis virus propagated in the allantoic cavity of chick embryos was compared with the indirect complement-fixation test, and the results were promising.

Jadin, J., Giroud, P. (1959). Présence des néo-rickettsies dans les tissus larvaires de Cysticercus bovis au Kivu et au Ruanda-Urundi. **[Isolation of a virus of the psittacosis-lymphogranuloma group from Cysticercus bovis in Kivu and Ruanda-Urundi.]**—Bull. Soc. Pat. exot. **52,** 420-422. **1847**

Cysticercus bovis from slaughter cattle were divided into 10 batches of 50 each, ground, emulsified and injected into mice by the nasal or i/p route and into g.pigs by the i/p route. From 4 batches a psittacosis-lymphogranuloma virus ("neo-rickettsia") was isolated; this was easily adaptable to mice by the pulmonary route. The serum of the g.pigs after 10 and 20 days reacted in micro-agglutination with the antigens T_{13} (from psittacosis of Brazilian parrots), X_{14} (isolated from a case of febrile exanthema) and V_{14} (isolated from a case of meningo-encephalitis). Non-parasitized muscle from the same cattle did not yield the infective agent. It is thought that *Cysticercus bovis* may be a virus vector and attention is drawn to the danger of storing infested meat at – 15°C., the ideal temperature for preserving the virus.—T.E.G.R.

Belyavin, G. (1959). **New serological techniques in the field of virus research.**—Brit. med. Bull. **15,** 193-196. **1848**

A short review of recent work employing the following serological techniques in the study of viruses. The virus tube (or "free") flocculation of virus antigen in antisera, gel diffusion, fluorescent antibody techniques, haemadsorption of viruses and its application to tissue culture studies and immune adherence.—W. E. Parish.

Pehl, K.-H. (1959). Knochenmark und Pathogenese bei einigen Viruskrankheiten der Haustiere. **[Role of bone marrow in the pathogenesis of virus diseases of domestic animals.]**—Arch. exp. VetMed. **13,** 1054-1206. **1849**

P. reviewed the literature and studied the bone marrow and peripheral blood in equine infectious anaemia, swine fever, Newcastle disease, fowl plague, Borna disease, Teschen disease, swine influenza, salmonellosis, staphylococcal infections and histamine toxicosis. He described methods of bone marrow biopsy in domestic animals and techniques of marrow and blood cell counts. There are 85 tables, 39 illustrations, mostly photomicrographs, and over 350 references.—E.G.

Tyrrell, D. A. J., Stuart-Harris, C. H., Andrewes, C. H. (1959). **Cytopathogenic vs cytopathic.**—Virology **8**, 539. **1850**

A suggestion that the word "cytopathic" rather than cytopathogenic be used in descriptions of the effect of viruses on cells to mean "causing or associated with cell destruction". —W. E. Parish.

See also abstr. **2032** (report, Australia); **2033** (report, Kenya); **2036** (book, virus diseases).

IMMUNITY

Crawford, H. J., Wood, R. M., Lessof, M. H. (1959). **Detection of antibodies by fluorescent-spot technique.**—Lancet December 26th, 1173-1174. **1851**

A simple and sensitive slide technique has been developed for the detection of antibodies in human serum. Thyroglobulin, nucleoprotein, or other concentrated antigens and a fluorescent conjugate with a high fluorescein/protein ratio are necessary. The slides are examined in ultraviolet light against a black background.

Osserman, E. F. (1960). **A modified technique of immunoelectrophoresis facilitating the identification of specific precipitin arcs.**—J. Immunol. **84**, 93-97. [Author's summary modified.] **1852**

A modification of the technique of immunoelectrophoresis described by Grabar & Williams (1953) has been developed which facilitates the identification of individual precipitin arcs in complex mixtures of proteins such as human serum. This modified procedure consists of the concurrent reaction of the antiserum with the electrophoretically separated primary antigen solution (*e.g.* whole serum) and with a known protein constituent. The technique was applied to the identification of the components in Cohn Fraction IV-7 (primarily the iron-binding globulin), ceruloplasmin, and the urinary proteins in a case of myeloma.

Dike, G. W. R. (1960). **Photographic recording of precipitin bands in agar gel.**—J. clin. Path. **13**, 87-89. **1858**

This paper describes a method of photography giving high contrast, and definition, and dimensional accuracy which is both cheap and capable of being carried out without an advanced knowledge of photographic technique.—R.M.

Ingram, D. G. (1959). **The conglutination phenomenon. XIII. In vivo interactions of conglutinin and experimental bacterial infection. XIV. The resistance enhancing effect of conglutinin and immuno-conglutinin in experimental bacterial infections.**—Immunology **11**, 322-333 & 334-345. [Author's summaries modified.] **1854**

Some interrelations between the conglutinating activity of the serum and bacterial infection were investigated, and passive transfer of activity was demonstrated. This activity was greatest within 2 days after s/c inj., then declined until no significant titres were demonstrable in 12 to 14 days. Infection with *Salmonella typhi-murium* causes a rapid reduction in the conglutinating activity of the serum immediately after challenge. Previous injection of conglutinin preparations enhances bactericidal activity of the mouse against *S. typhi-murium.*

The effect of conglutinin and immuno-conglutinin preparations on resistance has been studied in seven bacterial infections. In six infections—*S. typhi-murium, Past. septica, Klebsiella pneumoniae, Listeria monocytogenes, Str. pneumoniae* and *Str. pyogenes*—higher survival rates were demonstrated in mice previously injected with the conglutinin preparations.

Infection with avirulent strains or non-pathogenic organisms in lethal doses led to severe toxaemia against which the injection of conglutinin preparations failed to protect, but they did protect against virulent or adapted strains of the organisms. The protective factor is probably conglutinin.

Sewell, M. M. H. (1959). **Normal components of guinea-pig serum which may cause antigens to show an apparent anti-complementary effect.**—Nature, Lond. **183**, 1062. **1855**

Certain substances may combine with normal components of serum resulting in complexes that will fix complement, and thus produce an apparent anti-complementary effect due to the antigen in a test system. This was demonstrated by treating normal active g.pig serum with zymosan or Wasserman antigen, and after incubation an untreated sample retained more complement than the treated samples.

It is suggested that the presence of this effect may be determined in c.f. tests by the use of an amount of normal serum (inactive)

equivalent to that used to provide the complement.—W. E. Parish.

Monaenkov, A. M., Korchemkina, I. E., Mikhailova, G. M., Domracheva, Z. V. (1959). **[Physiological analysis of the individual immunological reactivity of serum-producing horses.]**—J. Microbiol., Moscow **30,** No. 10 pp. 60-67. [In Russian. Summary in English.] **1856**

72 horses were classified according to "type of nervous system" (equivalent to "temperament") into four groups: strong and stable, excitable, weak, and intermediate. The strong, stable type were more suitable for hyperimmunization against tetanus, diphtheria, gas gangrene or influenza than the weak type. —R.M.

Leskowitz, S., Waksman, B. H. (1960). **Studies in immunization. I. The effect of route of injection of bovine serum albumin in Freund adjuvant on production of circulating antibody and delayed hypersensitivity.**—J. Immunol. **84,** 58-72. [Authors' summary modified.] **1857**

Intramuscular and subcutaneous injection gave the highest circulating antibody levels, toe pad and intraperitonal injections were intermediate, and intradermal and intravenous injections were least effective. The toe pad and intradermal routes were most effective for production of delayed hypersensitivity; the i/m, s/c and i/p routes were less effective, and the i/v completely ineffective. An intravenous booster injection suppressed delayed hypersensitivity in all cases and caused significant increases in circulating antibody in animals inoculated by the i/p, i/d, i/v and toe pad routes.

Portmann, A., Auclair, J. (1959). Relation entre les lacténines et les agglutinines du lait de vache. **[Relationship between lactenins and agglutinins in cows' milk.]**—Ann. Inst. Pasteur **97,** 590-596. [Summary in English.] **1858**

The inhibitory and agglutinating effects of cow's milk on lactic acid streptococci were studied. Of 15 strains 11 were inhibited and agglutinated and the other 4 were not. The 11 strains were divided into 5 groups according to their behaviour in raw skim milk absorbed with suspensions of these bacteria. There was a constant relationship between inhibition and agglutination, indicating that both phenomena may be due to the same substances.—T.E.G.R.

Greenbaum, D. S., Miller, L. (1960). **Antibody in milk and its role in passive immunization.** —J. Lab. clin. Med. **55,** 229-244. [Authors' summary modified.] **1859**

Injection of diphtheria toxoid and *Salmonella pullorum* vaccine into the teat canal and subcutaneously in cows resulted in the appearance of specific antibodies in both milk and blood. The milk titre averaged 3% of the blood; this relationship was not altered by route of immunization. There was no consistent difference in the amount of antitoxin in milk from the quarters injected with toxoid and the other quarters, but the salmonella agglutinin titre was persistently higher in milk from injected quarters than in milk from other quarters. The levels of diphtheria antitoxin in the colostrum were considerably higher than those of the milk; salmonella agglutinin levels in the colostrum were similar, but lower.

Acute unilateral mastitis was induced with intramammary *Salmonella pullorum* vaccine in 1 cow which had been previously immunized with both antigens. An abrupt rise in antibodies in the milk from the inflammatory quarters followed; this was temporary for diphtheria antitoxin and persistent for salmonella agglutinins. The diphtheria antitoxin levels in the blood did not change, whereas there was a gradual rise in the salmonella titres. Thus, acute mastitis seemed to increase the permeability of the udder to antibodies.

Three human subjects with low diphtheria antitoxin titres ingested large doses of equine diphtheria antitoxin mixed with skim milk. Antitoxin was also injected through a tube into the jejunum of one of the subjects. In no instance was there a detectable increase in blood titres of subjects after ingestion of the antitoxin. Insufficient absorption of antitoxin seemed the most likely explanation.

Pierce, A. E. (1959). **Studies on the proteinuria of the new-born calf.**—J. Physiol. **148,** 469 -488. [Author's summary modified.] **1860**

Proteinuria developed during the first 30–40 hours of life in calves fed colostrum and was absent in similar calves fed boiled milk.

The transition from colostrum to milk was not the factor which terminated the absorption of immune lactoglobulin from the gut.

The results suggest that the proteinuria arose to some extent from low-molecular-weight protein in the colostrum which was

absorbed from the gut together with the immune lactoglobulin. Owing to the small molecular weight, this protein was subsequently cleared from the circulation by glomerular filtration. High concentrations of these proteins were not developed in the circulation and so remain undetected electrophoretically.

Speer, V. C., Brown, H., Quinn, L., Catron, D. V. (1959). **The cessation of antibody absorption in the young pig.**—J. Immunol. **83,** 632-634. [Authors' summary modified.] **1861**

Eight litters of nine pigs each were employed to determine how long after birth the baby pig is capable of absorbing antibodies from ingested colostrum containing *Escherichia coli* antibodies. A haemagglutination test was used to detect the presence of the antibodies in the serum. Baby pigs efficiently absorbed the *E. coli* antibodies at birth. This efficiency declined rapidly, and absorption was halved within 3 hours of birth and declined to insignificant amounts after 24 hours.

Olbrychtowa, F., Bzowska, B. (1959). Immunologiczne właściwości plemników kogutów. **[Immunological properties of cock semen.]**—Med. Wet., Warszawa **15,** 711-712. [In Polish.] **1862**

Two rabbits were given 4 and 5 i/m injections of cock semen suspended in 3·8% sodium citrate. The rabbits' sera subsequently agglutinated a 1% NaCl suspension of the cock spermatazoa to the titre of 1 :1024 and 1 : 2048 while serum from a control rabbit gave a titre of 1 : 16. The rabbits showed no ill effects and the agglutinated spermatozoa remained alive.—M. Gitter.

Crampton, C. F., Frankel, F. R., Rodeheaver, J. L. (1959). **Mechanism of immunological unresponsiveness.**—Nature, Lond. **184,** 873-875. **1863**

A theory is advanced to explain the mechanism of immunological unresponsiveness based on experiments on rabbits. It was found that rabbits rendered specifically unresponsive eliminated the specific antigen from the blood and distributed it among the body organs after an intravenous injection in the same manner as normal control animals. It therefore appeared that inability to form antibody did not result in persistence or tolerance of the antigen, nor that it was "recognized-as-self", and unresponsiveness did not appear to be dependent upon rapid elimination of the antigen.

It is suggested that the presence of antigen or haptenic fragments of degraded antigen may forestall antibody formation. Antibody formation may be initiated as usual in a small number of cells when rabbits have received antigen, but residual antigen or parts thereof may be stored within cytoplasmic granules and an intracellular antigen–antibody reaction take place with the first formed antibody resulting in destruction of the cell. Animals in a state of immunological tolerance, may lose their tolerance if the antigen is not continually administered, which is considered as evidence that antigen in some form must be retained in the potential antibody-forming cells.

Reference is made to the "selection theory" of antibody production and the phenomenon of auto-immunization.

—W. E. Parish.

Kaplan, H. S., Smithers, D. W. (1959). **Autoimmunity in man and homologous disease in mice in relation to the malignant lymphomas.**—Lancet July 4th, 1-4. **1864**

A short review with reference to the work of the authors. Those conditions termed "homologous disease" in mice, *i.e.*, "parabiosis intoxication", "secondary disease", "runt disease" and "wasting disease", resulting from experimental procedures in which homologous lymphoid cells introduced into another individual react with the lymphoid or other tissues of the host, have features in common with disease resulting from lymphoid neoplasia in man, principally body wasting, anaemia and lymphoid depletion. It is suggested that malignant lymphomas in man and "homologous disease" in mice may be due to a cyto-immunological reaction against the usual haematopoietic cells of the host.

—W. E. Parish.

Brambell, F. W. R., Hemmings, W. A., Oakley, C. L., Porter, R. R. (1960). **The relative transmission of the fractions of papain hydrolyzed homologous gamma-globulin from the uterine cavity to the foetal circulation in the rabbit.**—Proc. roy. Soc. Ser. B. **151,** 478-482. [Authors' summary modified.] **1865**

Molecules of rabbit gamma-globulin were split into three nearly equal pieces by papain. Trace-labelled with radio-iodine these three fractions were transmitted by the yolk-sac to

the circulation of the 24-day rabbit foetus in significantly different quantities. It was suggested that fraction III, which contains most of the antigenic groups of the original molecules, also had the configuration recognized by the cells as homologous gamma-globulin.

See also abstr. **1678** (fluorescent antibody in anthrax); **1682** (immunochemistry of soluble antigens of tubercle bacilli); **1683-1684** (c.f. test in Johne's disease); **1690** (swine erysipelas); **1692** (listeria agglutinins in serum of healthy cows); **1699** (calf scours); **1702** (coli-antigens); **1704** (fowl typhoid); **1705-1707 & 1710-1719** (brucellosis); **1728** (Cl. oedematiens antigens); **1729-1730** (enterotoxaemia vaccines); **1753** (precipitins against fungi in man); **1763** (trypanosomiasis); **1772-1780** (F. & M. disease); **1787-1795** (rabies); **1800** (influenza); **1802-1804** (Japanese encephalitis); **1808** (B-virus vaccine); **1809** (diagnosis of equine infectious anaemia); **1813-1817** (rinderpest); **1822** (bovine papillomatosis); **1829-1830** (swine fever and erysipelas vaccine); **1840-1842** (Newcastle disease); **1843-1845** (avian infectious bronchitis); **1846** (ornithosis); **1848** (new serological techniques in virus research); **1093** (hydatid disease).

PARASITES IN RELATION TO DISEASE [GENERAL]

Davis, L. R., Herlich, H., Bowman, G. W. (1959). **Studies on experimental concurrent infections of dairy calves with coccidia and nematodes. I. Eimeria spp. and the small intestinal worm, Cooperia punctata.**—Amer. J. vet. Res. **20**, 281-286. **1866**

In two experiments calves inoculated with both coccidia and *Cooperia punctata* showed greater clinical signs than calves with a single infection. Infection with *Eimeria* spp. alone was more severe than that with *Cooperia* alone. In *Cooperia*-infected calves nearly one third of the worms recovered P.M. were immature, whereas in *Eimeria* / *Cooperia*-infected calves the immature ranged from 0–14% suggesting that the *Eimeria* spp. interfere with the host's usual immune response to worm infections.—B. M. Wilson.

Seifert, H. (1959). Bekämpfung der Ekto- und Endoparasiten bei Rindern und Schafen in Perú. **[Control of ecto- and endoparasites in cattle and sheep in Peru with Neguvon.]**—Vet.-Med. Nachr. No. 3 pp. 118-135. **1867**

Neguvon (Dipterex) as a 1% dipping fluid or a 0·75% spray killed ticks and flies on cattle, but had no lasting effect. Systematic spraying with 0·75% soln. eliminated flies from byres. Spraying with a 2·5% soln. killed sand fleas *(Tunga penetrans)*. An oral dose of 80 mg./kg. in cattle and 10–20 mg./kg. in sheep or provision of a salt lick containing 10% Neguvon killed ticks and keds and greatly reduced intestinal parasites. Wounds dressed with a paste containing 10% Neguvon remained free from *Lucilia* larvae.—M.G.G.

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

Sinclair, A. N., Gibson, A. J. F. (1959). **Surface spraying and dusting for the control of ectoparasites of sheep. III. A comparison of the relative efficiency of surface spraying and jetting to control blowfly strike in sheep.**—Aust. vet. J. **35**, 420-423. **1868**

The efficiency was compared of completely saturating the wool of the crutch area ("jetting"), with applying insecticide to the surface of the wool only (tip spraying) for control of crutch strike in Merino ewes in the field.

Both treatments were applied with mechanical spray races, using dieldrin emulsion, 0·025% for "jetting" and 0·25% for tip spraying. Although tip spraying used about three times as much insecticide it was estimated that the amount deposited on the sheep was about the same with each device. 1,408 sheep were treated at the rate of 360 per hour with the jetter and 205 at the rate of 50 per min. with the tip spray. The volume of fluid used was 0·41 gal. per sheep for jetting and 0·08 gal. for tip spraying. The sheep were marked and run together. The first strikes occurred in both groups when flies became active 6–7 weeks after treatment. Over the next 10 weeks 0·6% of the jetted sheep, and 6% of the tip-sprayed group, were struck.

Other flocks on the same property were jetted and tip-sprayed and run in separate paddocks. Strike rates for the jetted flocks were 1·3, 4 and 15% : sheep in the third flock had become dirty through scouring. In the remaining flock which was tip-sprayed with a different mechanical device 7% of strikes were recorded.

The authors conclude that jetting, despite the slower rate of treatment, is the preferable method of application. The advantage gained in speed with tip-spraying can be lost in the economic disadvantage of having to re-treat large numbers of sheep, or even the whole flock.—N. P. H. Graham.

Graham, N. P. H., Sinclair, A. N., Cavey, W. A. (1959). **Control of insecticide exhaustion in sheep showers.**—Aust. vet. J. **35**, 99-100. **1869**

The exhaustion (stripping) of the active ingredient of water-insoluble insecticides from suspension or emulsion type dips can be

prevented by a system of constant replenishment. The theoretical basis for this is given, supported by field trials using diazinon. Considerable benefits are claimed: the instructions for use are simpler, less insecticide is used and the volume of a sump of a shower dip can be reduced from 500 to 100 gal.

—M. D. Murray.

Knipling, E. F. (1959). **Sterile-male method of population control. Successful with some insects, the method may also be effective when applied to other noxious animals.**—Science **130,** 902-904. **1870**

The introduction of sexually sterile but otherwise sexually vigorous males, and to a lesser extent females, into a natural population has a greater reducing effect on the population than the elimination (*e.g.* insecticidal) of the same number of individuals. K. discussed this with theoretical models and suggested the adoption of the sterile-male method for control of wild animals.—W. N. Beesley.

Anon. (1960). **Florida screwworm eradication facilities closed.**—J. Amer. vet. med. Ass. **136,** 18. **1871**

Between July 1958 and November 1959, more than 2,750 thousand million sterilized *Callitroga americana* flies were released over 85,000 square miles in Florida and parts of Alabama and Georgia. As no screwworms have been found in this region since June, 1959, the campaign has ceased. Intensive spraying is being carried out in Mississippi to control recent outbreaks there.—M.G.G.

Landi, S. (1960). **Bacteriostatic effect of haemolymph of larvae of various botflies.**—Canad. J. Microbiol. **6,** 115-119. [Author's abst.] **1872**

Haemolymph from larvae of *Cuterebra, Cephenomyia, Oestrus,* and *Gasterophilus* inhibits the growth of several species of *Sarcina* and *Micrococcus* on nutrient media. The bacteriostatic substance in the haemolymph is thermostable and retains its bacteriostatic activity after it is diluted.

Lührs, E. (1960). Versuche zur Abtötung der Dassellarven im Tierkörper. **[Destruction of warbles in calves.]**—Prakt. Tierarzt No. 2 pp. 36-38. **1873**

The back of 4 calves was warmed to 33°C. for an hour twice daily from February 15th by means of a heating element held at a distance of 50 cm. Very few warbles developed and they appeared several weeks later than in untreated calves. No warbles developed in 2 calves, the back of which was warmed continuously to 40°C. from December 23rd onwards, compared with 57 warbles in 2 untreated calves. It is considered that the warmth reduced the content of unsaturated fatty acids in the back fat, rendering it unfavourable for warbles.—M.G.G.

I. Weintraub, J., Rich, G. B., Thompson, C. O. M. (1959). **Timing the treatment of cattle with Trolene for systemic control of the cattle grubs Hypoderma lineatum (De Vill.) and H. bovis (L.) in Alberta and British Columbia.**—Canad. J. Anim. Sci. **39,** 50-57. **1874**

II. Weintraub, J., Thompson, C. O. M., Qually, M. C. (1959). **Low-level feeding of Trolene for control of the cattle grubs Hypoderma lineatum (De Vill.) and H. bovis (L.).** —Ibid. 58-63. **1875**

I. Trolene (Dow ET-57) was administered orally as a treatment of calves for warble control at a therapeutic level lower than that reported as capable of inducing first symptoms of toxicity. 30 calves were treated in November, January, March and April in Alberta and 25 in December, January, February and March in British Columbia. Control of the migrating larvae was equally effective on the first three treatment dates with close to 100% mortality. Variations in numbers of larvae precluded a precise estimation of mortality at either location other than within a range of 90 to 100%. No significant difference in mortality between larvae of the two species was observed but the third hypodermal instar larvae of both species were less affected by treatment than those of the preceding instars. To forestall the third-instar larvae and early damage by "warbles", early autumn treatments were recommended. For some unknown reason, slight toxic symptoms (lethargy, ataxia, reduced food consumption) were observed in both groups of calves after the first and second treatment, but enforced exercise reduced the symptoms within 48 hours of treatment without the use of antidotes.

II. In calves fed individually for 18 days on a ration of crushed oats treated with Trolene giving a daily dosage of 10 mg./kg., the mortality of migrating hypoderma larvae was 94% (not significantly different from the 97% mortality obtained with a single bolus dose of 100 mg./kg.); but the low level dosage, ineffective against migrating larvae during the first week reached its full effect during the second week of treatment. Mild

diarrhoea was the only sign of toxicity observed.

In a field experiment, two groups of calves which had consumed treated range feeding blocks at averages of 7·7 and 4·2 mg. Trolene/kg. for 93 and 64 days respectively, larval mortality was 95% and 88%. In both groups larval mortality was higher than in a control group (80%) after a single bolus treatment of 110 mg./kg. The results indicate that the low-level feeding method would be practical in the field though the total consumption of Trolene by this method was considerably higher than from a single dose.

—R. V. L. Walker.

Anon. (1959). **Co-Ral emulsifiable concentrate. A survey of information on the use of the Bayer insecticide 21/199 for control of the warble fly.**—pp. 19. Berkhamsted: Cooper, McDougall & Robertson Ltd. **1876**

The properties of Co-Ral and its use in warble-fly control are reviewed. A dressing of 1–2 pints of 2% wash (made from 16% emulsifiable concentrate), at any time between November and January, is recommended; young calves, animals in advanced pregnancy, milking cows and cattle within 60 days of slaughter should not be treated. The toxicity and fate of Co-Ral in the body are discussed.

—W. N. Beesley.

Kohler, P. H., Rogoff, W. M. (1959). **Studies with phenothiazine and Hypolin for the control of cattle grubs.**—J. econ. Ent. **52,** 1223-1224. **1877**

Calves were drenched with "Hypolin" (a mixture of phenothiazine, di-n-butyl tin laurate, and hexachlorethane), or with phenothiazine only, at the rate of 210 mg./kg. body wt., once monthly for 4 months. In a second experiment, phenothiazine was fed in trace-mineralized salt, at the rate of 7 mg./kg., daily for 144 days. Neither treatment gave any control of warble grubs.—W. N. Beesley.

I. Theiler, G., Salisbury, L. E. (1959). **Ticks in the South African zoological survey collection—Part IX—"The Amblyomma marmoreum group".**—Onderstepoort J. vet. Res. **28,** 47-124. **1878**

II. Salisbury, L. E. (1959). **Ticks in the South African zoological survey collection—Part X—Rhipicephalus mühlensi.—Ibid.** 125-132. [Authors' summaries.] **1870**

I. *Amblyomma variegatum* var. *nocens,* Robinson 1911, is re-established as a valid species with the new name combination of *Amblyomma nocens.*

A list of synonyms is given for *A. nocens* and *A. pomposum.*

A. pomposum is shown to be distributed in the Rhodesian Highland type of vegetation; *A. nocens,* according to present records appears to be confined approximately between latitudes 18–22° S. and between the Drakesberg and the coast.

II. The male and female of *R. mühlensi* are redescribed and the larva and nymph described for the first time, from material reared at Onderstepoort. Host lists and geographical distribution for *R. mühlensi* and the closely related *R. masseyi* are given.

Gregson, J. D. (1959). **Tick paralysis in groundhogs, guinea-pigs and hamsters.**—Canad. J. comp. Med. **23,** 266-268. [Summary in French.] **1880**

While ground-hogs *(Marmota flaviventris avara)* are very susceptible to paralysis by *Dermacentor andersoni,* g.pigs and hamsters were also susceptible whether the ticks had fed entirely on one individual or were transferred to it after partial feeding on another species of animal. When ticks known to have produced paralysis were transferred to normal animals they often continued to produce paralysis with symptoms within 12 to 18 hours in comparison to the 4 to 6 days required by unfed ticks. Paralysis in experimental animals was shown, by the presence of a neuromuscular block, to resemble that similarly produced in large domestic animals.

—R. V. L. Walker.

Riek, R. F., (1959). **Studies on the reactions of animals to infestation with ticks. IV. The protein components of tick extracts.**—Aust. J. agric. Res. **10,** 604-613. **1881**

Filter paper and starch electrophoresis and gel diffusion were used to separate and identify the various components in extracts of eggs and larvae of *Boophilus microplus.* Changes in the relative protein composition with increasing age were found. Seven fractions were identified: three in the egg extract and one in the larval extract were usually associated with toxicity to laboratory animals. Fraction 1, a gamma globulin, was largely responsible for the development of skin hypersensitivity. Toxicity decreased with the age of eggs and larvae, 14-day larvae being relatively non-toxic.

Some of the components of egg and larval

extracts were similar or closely related and immunization with larval extracts prevented the toxic effects of egg extracts.

—M. D. Murray.

Riek, R. F. (1959). **Studies on the reactions of animals to infestation with ticks. V. Laboratory animals as hosts for the cattle tick, Boophilus microplus (Canestrini).**—Aust. J. agric. Res. **10,** 614-619. [Author's summary modified.] **1882**

When an Elizabethan collar was fitted to prevent biting and scratching, successful development of *Boophilus microplus* was obtained on the white mouse and rabbit, but not on the g.pig. Development on mice was little slower than on cattle, but mortality was high, and replete females were less than half the normal weight. There was an inconstant, round-cell reaction to attachment of larvae, but a more acute, polymorphonuclear response to nymphs and adults, and a tendency to wall off the haustellum of the tick by ingrowing epithelium or inflammatory tissue.

Drummond, R. O., Moore, B., Warren, J. (1959). **Tests with insecticides for control of the winter tick.**—J. econ. Ent. **52,** 1220-1221. **1883**

Dermacentor albipictus is found in Canada and several northern and western States of the U.S.A. In the south-west it occurs only from November-February.

Cattle were sprayed with insecticides under 100 or 250 lb./sq. in. pressure, and usually 2 gal./head. 0·5% toxaphene was used as a control. Results varied between 1957 and 1958, but 0·5% Co-Ral (Bayer 21/199) and 0·15% Delnav [2, 3-*p*-dioxanedithiol-*S, S* -bis (*O, O*-diethyl phosphorodithioate)] gave better control over a 2 month period than did toxaphene. (Ronnel, Sevin and Bayer 22408 gave good control for one month). 0·25% malathion was unsatisfactory.

—W. N. Beesley.

Graham, N. P. H. (1959). **The control of itch mite (Psorergates ovis) in sheep.**—Aust. vet. J. **35,** 153-155. **1884**

Economical control of itch mite is discussed. The cheapest material is an arsenical dip. Lime-sulphur, more reliable but more costly, may be used where the problem is acute.

—M. D. Murray.

Cumming, R. B. (1959). **Respiratory acariasis of canaries and Gouldian finches.**—J. S. Afr. vet. med. Ass. **30,** 31-32. **1885**

Respiratory acariasis caused by the mite *Sternosoma tracheocolum,* which is widespread in South Africa in canaries, is also reported by the author in Gouldian finches *(Peophila gouldiae).*

The symptoms are described and it is stated that the disease is more rapidly fatal in Gouldian finches than in canaries.

An account of the successful treatment of both species with 5% malathion powder is given.—I. F. Keymer.

Kraemer, P. (1959). **Relative efficacy of several materials for control of poultry ectoparasites.**—J. econ. Ent. **52,** 1195-1199. **1886**

Korlan [Dow ET-57] sprayed as a 0·1 or 0·25% emulsion controlled *Menacanthus stramineus* and *Ornithonyssus sylviarum* in fowls. Dylox [Dipterex] sprayed as a 0·5% or 1% soln. controlled *M. stramineus* but not *Argas persicus.* Sevin [1-naphthyl-*N*-methyl carbamate] as a 0·5% dust or emulsion spray controlled all 3 parasites. *O. sylviarum* was controlled also by 0·1% Co-Ral [Bayer 21/199] suspension, and 0·25% Dibrom emulsion [*O, O*-dimethyl-*O*-(1, 2-dibromo-2, 2-dichloroethyl) phosphate] but not by 4% Dibrom dust, 0·1% Tedion suspension, 4% Tedion dust, 15% Delphene dust, or Santocel, a powdery silica aerogel.—M.G.G.

See also absts. 1867 (neguvon against ecto- and endoparasites in sheep and cattle); 2031 (report, Australia); 2033 (report, Kenya).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

Dawes, B. (1959). **Penetration of the liver-fluke, Fasciola hepatica into the snail, Limnaea truncatula.**—Nature, Lond. **184,** Suppl. No. 17 pp. 1334-1335. **1887**

After initial adhesion to the integument miracidia of *F. hepatica* perforate the integument of the host snail by the loosening, cytolysis and abstraction of epithelial cells, probably as the result of enzyme activity. The larva has lost its ciliated epithelium before penetration has been completed and may be considered to be already a sporocyst.

—S. B. Kendall.

Demidov, N. V., Veselova, T. P. (1959). **[Intramuscular carbon tetrachloride for treat-**

ment of liver flukes in cattle.]—Veterinariya,, Moscow **36,** No. 12 pp. 12-13. [In Russian.] **1888**

In trials organized by the All-Union Institute of Helminthology over 10,000 cattle were injected with carbon tetrachloride by a method previously described [*V.B.* **30,** 173]. No losses or complications were recorded, apart from agitation, muscle tremors and cessation of rumination in some animals which lasted for 30 min. to 1 hour. The method was recommended for use in autumn and spring. —R.M.

Lungu, V., Stoican, E., Fromunda, V. (1959). Tratamentul fasciolozei ovine cu amestec uleios de tetraclorură de carbon şi hexacloretan prin administrare parenterală. [**Treatment of liver fluke in sheep by subcutaneous injection of hexachloroethane dissolved in carbon tetrachloride and liquid paraffin.**]—Lucr. Inst. Pat. Igiena anim., Bucureşti **9,** 325-332. [In Roumanian. Summaries in French and Russian.] **1889**

The mixture of hexachloroethane and carbon tetrachloride described by Grigoryan and others [*Helminth. Abstr.* **24,** 680 (1955)] proved unsatisfactory because the hexachloroethane crystallized out when the mixture was cooled from 80°C. The present authors overcame this by mixing 3 ml. of carbon tetrachloride, 1·5 g. of crystalline hexachloroethane and 1 ml. of "vaseline oil" [? liquid paraffin]. This mixture was injected s/c near the base of the tail in doses of 4 ml. for sheep up to one year of age and 5 ml. for adults [see *Anu. Inst. Pat.* **8,** 349 (1958)]. Trials on 1,146 sheep confirmed its efficacy. The inner surface of the thigh was a better site than the base of the tail. Sheep killed between 48 hours and 30 days after treatment were judged fit for human consumption. In some carcasses there was a faint smell of the medicament around the site of injection, but this disappeared 2 hours after slaughter.—R.M.

Paskal'skaya, M. Y. (1959). [**Eradication of Moniezia infestation in sheep by quadruple anthelmintic treatment with copper sulphate.**] —Veterinariya, Moscow **36,** No. 10 pp. 21-23. [In Russian.] **1890**

Treatment with anthelmintic doses of 1% copper sulphate soln. was performed 4 times at intervals of 25–30 days, commencing 25–30 days after the sheep were turned out to pasture. Only lambs were given the third and fourth treatments.—R.M.

Froyd, G., Round, M. C. (1959). **Infection of cattle with Cysticercus bovis by the injection of onchospheres.**—Nature, Lond. **184,** Suppl. No. 19 p. 1510. **1891**

Cysts were found at the injection site in 10 of 20 cattle injected s/c and/or i/m with oncospheres of *Taenia saginata.* Four animals injected i/v were not infected.—E.V.L.

Ginsberg, A., Grieve, I. M. (1959). **Two unusual cases of liver cysticercosis.**—Vet. Rec. **71,** 618. **1892**

In Kenya 1·2% of livers are infested with *Cysticercus bovis.* The authors report two unusual cases : in one 44 cysts were found under the liver capsule, and in the other 1,836 throughout the whole of the parenchyma. In neither case were cysts found in other organs or skeletal muscles.—B. M. Wilson.

Fischman, A. (1960). **Flocculation tests in hydatid disease.**—J. clin. Path. **13,** 72-75. [Abst. from author's summary.] **1893**

A new serological technique of diagnosing human hydatid disease, employing polystyrene latex particles coated with hydatid cyst fluid, and a modified technique using bentonite particles are described.

Ross, J. G., Armour, J., Lee, R. P. (1960). **Further observations on the influence of genetical factors in resistance to helminthiasis in Nigerian zebu cattle.**—Vet. Rec. **72,** 119-122. [Authors' summary modified.] **1894**

When calves of a line of zebu cattle that exhibited resistance to haemonchosis [see *V.B.* **29,** 1842] were infected with strongyles, they had lower faecal egg counts and higher c.f. titres than calves of a susceptible line. Evidence suggests that c.f. antibody may be in the gamma 1 fraction of the serum globulins and that additional antibodies may be in the gamma 2 fractions. The value of serum albumin levels in assessing the pathogenicity of helminth burdens is discussed.

Lee, R. P., Armour, J., Ross, J. G. (1960). **The seasonal variations of strongyle infestations in Nigerian zebu cattle.**—Brit. vet. J. **116,** 34-46. **1895**

During the dry season in northern Nigeria, few or no strongyle ova were found in the faeces of young calves and moderate numbers in the faeces of older cattle. From May to September, when the monthly rainfall exceeded 6 inches and the average maximum temp. was 90°F., all animals acquired heavy infestations with *Haemonchus, Cooperia,*

Oesophagostomum and *Bunostomum*. *Trichostrongylus* infestations were light; high temp. was thought to be unfavourable to this species. The optimum temp. and rainfall for the different species were discussed, with a view to predicting outbreaks of helminth infestation.—M.G.G.

Baker, N. F., Cook, E. F., Douglas, J. R., Cornelius, C. E. (1959). **The pathogenesis of trichostrongyloid parasites. III. Some physiological observations in lambs suffering from acute parasitic gastroenteritis.**—J. Parasit. **45,** 643-651. [Authors' summary modified.] **1896**

Peripheral blood patterns, and iron and copper in plasma and liver were studied in 11 lambs infected with trichostrongyles.

Where *Haemonchus contortus* predominated, a severe anaemia complicated by iron deficiency was noted. In all cases the liver iron was reduced, but only in lambs with iron stores of from 0·7 to 2·5 mg. per 100 g. of fresh liver accompanied by marked anaemia was the plasma iron reduced. Dietary supplementation of $FeSO_4$ did not increase the liver iron even though all the parasites had been removed. This was due either to interference with intestinal absorption or to the blood-sucking by *Ostertagia* and *Trichostrongylus*.

It was estimated that *H. contortus,* and possibly other genera, removed 140 ml. (12 to 14%) of the blood of a lamb each day.

No changes in plasma or liver copper attributable to the nematodes were detected. The peripheral blood patterns of severely anaemic animals were commensurate with that of haemorrhagic anaemia with superimposed iron deficiency.

Thomas, R. J. (1959). **I. A comparative study of the life histories of Nematodirus battus and N. filicollis, nematode parasites of sheep. II. Field studies on the seasonal incidence of Nematodirus battus and N. filicollis in sheep.** —Parasitology **49,** 374-386 & 387-410. [Author's summaries modified.] **1897**

I. The life histories of these two species are compared with those of *N. spathiger* and *N. helvetianus* and follow the same pattern, with minor variations in timing which appear to be specific. The pathogenesis of *Nematodirus* species is discussed and related to the migration of larvae into the intestinal mucosa.

II. The seasonal incidence of *Nematodirus* infection in sheep was followed by faecal egg counts, P.M. examination and pasture larval studies. Only one generation of adults was produced each year and a prolonged resting stage on the pasture was necessary.

Tetley, J. H. (1959). **I. The seasonal availability to sheep of infective nematode larvae on pasture. II. The availability of the infective stages of nematode parasites to sheep in early spring. III. The extent to which self-augmentation of nematode parasitism occurs in lambs. IV. Development of Haemonchus contortus in weaned and unweaned lambs.**— J. Helminth. **33,** 281-288; 289-292; 293-300 & 301-304. [Author's summaries modified.] **1898**

I. The seasonal availability of nematode infective larvae under farm conditions was investigated by exposing worm-free lambs for two weekly periods in the fields. Worm populations were estimated at P.M. examination. *Nematodirus* spp. were acquired in greatest numbers in the autumn after the date by which lambs normally have acquired resistance to superinfection.

Greatest numbers of *Haemonchus contortus* were acquired in summer. Heavy contamination of pasture with eggs of this species by ewes in the spring did not result in large populations in their lambs.

II. Previously uninfected 11-month-old sheep were used as indicators of the availability of the infective larvae in early spring. *Ostertagia* and *Nematodirus* species were acquired in much larger numbers than other species. It is concluded that the incidence in spring born flock lambs is due to the numbers of infective larvae and is not associated with the stage of development of the lambs.

III. During summer *Ostertagia* and *Nematodirus* species considerably outnumbered *H. contortus, Trichostrongylus* spp., *Cooperia* spp. and *Strongyloides papillosus*.

It is concluded that, for this particular period and year, self-augmentation of *Ostertagia* parasitism took place in lambs.

The process did not occur, or only to minor extent, with other species before midsummer.

IV. *Haemonchus contortus* infective larvae were given to previously uninfected weaned and unweaned Romney lambs. Difference in susceptibility between the groups was not found.

Rose, J. H. (1959). **Metastrongylus apri the pig lungworm. Observations on the free-living embryonated egg and the larva in the**

intermediate host.—Parasitology **49,** 439-447. [Author's summary modified.] **1899**

The viability of embryonated eggs in soil was adversely affected by dryness. The rate of development of larvae in the intermediate host was reduced as the temperature fell.

The longevity of the infective larvae appeared to be largely determined by the longevity of the earthworm intermediate host, although they were able to survive for a time when separated from the earthworm's tissues.

Euzéby, J. (1959). Traitement de la syngamose aviaire par l'aérosolthérapie anthelminthique. **[Aerosol treatment of syngamosis in fowls.]**—Rev. Méd. vét. **110,** 801-803. **1900**

An aerosol of emulsified phenols, pyrethrins and rotenones in pine and eucalyptus oils, "Nematox-777", was used in syngamosis in fowls. Clinical results were good, but parasitological results were not, the lethal action on the worms not being high. The action was improved by addition of 0·1% of lindane.—F. R. Paulsen.

Soulsby, E. J. L., Coombs, R. R. A. (1959). **Studies on blood group substances associated with Ascaris lumbricoides.**—Parasitology **49,** 505-510. [Authors' summary.] **1901**

Human anti-A and anti-B and pig anti-A agglutinins were neutralized by *Ascaris lumbricoides* materials. The infection of pigs with *A. lumbricoides* stimulated the production of anti-A agglutinin but this agglutinin appeared to have no protective action. *Oesophagostomum dentatum* infection in pigs did not affect the anti-A agglutinin levels.

Sprent, J. F. A. (1959). **The life history and development of Toxascaris leonina (von Linstow 1902) in the dog and cat.**—Parasitology **49,** 330-371. [Author's summary modified.] **1902**

The nomenclature and host specificity of *Toxascaris leonina* is reviewed and the conclusion is reached that this parasite occurs in a wide range of feline and canine hosts. The distribution and growth of the larvae in mice, cats, and dogs is reported. A feline and a canine strain were used and infection of cats and dogs was produced both by feeding eggs containing second-stage larvae and by feeding mouse tissues containing third-stage larvae.

As the canine and feline strains grew to the adult stage in both cats and dogs, it was concluded that these two strains constituted a single species.

A description is given of the morphology of the larval stages.

The life history and development of *T. leonina* were compared with those of *Ascaris* spp. and *Toxocara* spp. It was concluded that they indicated a closer affinity to the former than the latter.

The migratory behaviour of the larvae of *T. leonina* was discussed, in relation to adaptation to infection in both Canidae and Felidae. It was suggested that delay in migration of second-stage larvae from the intestinal wall is an adaptation to a range of hosts which includes scavengers and predators. If larvae from ingested eggs develop in the intestinal wall of a suitable final host, they migrate towards the intestine, but if in the intestinal wall of an animal unsuitable as a final host, they migrate towards the abdominal cavity and, becoming encapsulated in various tissues, await ingestion by a predator.

Klimeš, B., Bašta, J. (1959). Zur Bionomie der unreifen Stadien von Ascaridia galli und zur Behandlung der befallenen Küken mit Benzin, Tetrachlorkohlenstoff und Piperazin. **[Bionomics of immature stages of Ascaridia galli and treatment of infested chicks with petrol, carbon tetrachloride and piperazine.]**—Arch. Geflügelk. **23,** 409-416. [Summary in English.] **1903**

188 chicks were given *A. galli* ova and treated after 28 or 33 days. Infestation was eradicated in 95% of chicks given 2·5 ml. petrol per kg. body wt., 85% given 225 mg./kg. piperazine citrate, and 68% given 1·5 ml./kg. carbon tetrachloride. Mortality was 37% in chicks given 465 ova at 18 days of age, but only 1% in chicks given 640 ova at 35 days. Most larvae were found in the middle region of the small intestine.—M.G.G.

Mastronardi, M. (1959). A proposito di una sindrome mediastinica osservata in un cane e determinata de una speciale localizzazione di Spiroptera sanguinolenta. **[Mediastinal syndrome caused by Spiroptera (Spirocerca) sanguinolenta in a dog.]**—Acta med. vet., Napoli **5,** 211-222. [Summaries in English and French.] **1904**

A dog aged 3 years had: fever, dry cough, dyspnoea, anorexia, sialorrhoea, priapism, slow pulse, pale mucous membranes, dullness, enlarged and painful lymph nodes. Routine tests were inconclusive. *Post mortem* some lymph nodes were enlarged and the medulla was hyperaemic; in the mediastinum, intimately connected with the oesophagus and

the oesophageal nerve, there was a cyst, the size of a pigeon's egg, containing *Spirocerca sanguinolenta*.—T.E.G.R.

Hovorka, J. (1959). Príspevok k štúdiu sezónnosti telaziózy hovädzieho dobytka v ČSR. **[Seasonal incidence of thelazia infestation in cattle in Czechoslovakia.]**—Folia vet., Košice **3,** 237-249. [In Slovak. Summaries in English, German and Russian.] **1905**

Eyes from 2,621 slaughtered cattle in Slovakia were examined during 1954-57. *Thelazia rhodesi* was present in 606, *Th. skriabini* in 161 and *Th. gulosa* in 91 cattle. Intensity and incidence of infestation appeared to depend on air temperature and moisture; in the case of *Th. rhodesi* it was highest in wooded lowland regions and lowest in highlands. Incidence was highest in October and November, lowest in June and July. Treatment by irrigation through the nasolacrimal duct with 0·05% Lugol's soln, and the use of insect repellents around the eyes, was described.—E.G.

Nardi, E., Grimaldi, A. (1959). Ricerche preliminari sull'attività del "Neguvon" contro i nematodi intestinali del cane. **[Neguvon as an anthelmintic in dogs.]**—Vet. ital. **10,** 917-921. **1906**

Neguvon (Dipterex) given orally to dogs at 80 mg. per kg. body wt. had a nematocidal action on *Uncinaria stenocephala* and *Toxocara canis,* but not on *Ancylostoma caninum.* Only one of ten animals showed diarrhoea.—F. R. PAULSEN.

Dirksen, G., Radermacher, F. (1960). Erste Ergebnisse der Allgemeinbehandlung der Stephanofilariose ("Sommerwunden") des Rindes mit Antimosan und Neguvon. **[Treatment of Stephanofilaria infestation in cattle ("summer sores") with stibophen and Neguvon.]**—Dtsch. tierärtzl. Wschr. **67,** 70-72. [Summary in English.] **1907**

Three s/c injections, at weekly intervals, of 0·63 g. stibophen per 50 kg. body wt. cured 12 of 21 cattle with *Stephanofilaria* infestation, and 7 showed an improvement. Side effects were seen. A single oral dose of 60 mg./kg. Neguvon (Dipterex) cured 17 of 32 infected cattle. A second dose 4 weeks later cured 5 more and the remaining 2 showed an improvement. Neguvon is recommended for this condition, both by mouth and topically.—M.G.G.

Sharaf, A., Haiba, M. H., Shihata, I. M. (1959). **An in vitro investigation into the anthelmintic properties of a phenothiazine and hexachlorethane compound.**—Brit. vet. J. **115,** 444-445. **1908**

The motility of *Fasciola gigantica* was increased by 5–100 mg. of a proprietary blend of phenothiazine and hexachlorethane wettable powder in 50 ml. Tyrode's soln. 10–100 mg./50 ml. had a similar influence on *Ascaris vitulorum* and 1–100 mg./50 ml. on *Dipylidium caninum.* The motility of intestine from cows and dogs was stimulated by 10–20 but inhibited by 50–100 mg./50 ml.—M.G.G.

See also absts. **1847** (isolation of psittacosis-lymphogranuloma virus from Cysticercus bovis); **1866** (concurrent coccidiosis and C. punctata infestation in calves); **1867** (control of ecto- and endoparasites in cattle and sheep); **2030** (report, Canada); **2032** (report, Australia).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

Vismara, E. (1959). Contributo alla conscenza delle neoplasie primitive del timo. **[Primary neoplasms of the thymus gland in cattle.]**—Clin. vet., Milano **82,** 406-414. **1909**

An account of non-metastatic lymphosarcoma-like tumours of the thymus in 2 heifers aged 7 months and 2 years respectively, with 5 photomicrographs.—T.E.G.R.

Cotchin, E. (1959). **Spontaneous carcinoma of the urinary bladder of the dog.**—Brit. vet. J. **115,** 431-434. **1910**

An account of 22 cases.—R.M.

Orkin, M., Schwartzman, R. M. (1959). **A comparative study of canine and human dermatology. II. Cutaneous tumors—the mast cell and canine mastocytoma.**—J. invest. Derm. **32,** 451-466. **1911**

A description of mastocytoma in 13 dogs seen at The College of Veterinary Medicine in Minnesota. There was a striking similarity between these cases and some cases of urticaria pigmentosa in man.—R.M.

Tommasini, A., Marcato, P. (1959). Contributo allo studio dei meningiomi negli animali domestici. **[Meningioma in domestic animals.]**—Acta med. vet., Napoli **5,** 429-447. [Summaries in English, French and German.] **1912**

Literature on meningioma is reviewed and an illustrated account of the condition in 2 cattle and a dog is presented.—T.E.G.R.

Di Domizio, G. (1959). Su di un linfoblastoma giganto-follicolare in suino raffrontabile alla malattia di Symmers-Brill. [**Follicular lymphoblastoma in a pig.**]—Acta med. vet., Napoli **5,** 325-334. [Summaries in English and French.] **1913**

In a sow, aged 8 months, with necrotizing areas on the ears, on the tip of the tail and on the buttocks, all the lymph nodes especially the mesenteric were enlarged (size of a walnut to an orange) and hard, consisting of shining greyish white or marbled lardaceous tissue. The spleen was enlarged, had a greyish network on its surface and, on section the follicles were the size of peppercorns with ill defined outline. The liver was enlarged and greyish-yellow with thickening of the interstitial tissue which, at the margins of the lobes, reduced the lobule to a small, central, yellowish-red point. The lungs were emphysematous and, on section, had a marbled appearance. The most characteristic histological changes were in the lymph nodes. The follicles were increased in size and number and consisted of reticular histiocytes, lymphoblasts, lymphocytes and Sternberg-Reed cells. Eosinophilia was observed, especially in the mesenteric nodes. The spleen follicles were decreased in numbers and only a few were enlarged, with structural changes similar to those in the node follicles. The pulp was congested and, in the stromal network, contained lymphoblastic histiocytes and plasma cells. In the kidneys there was lymphoblastic and lymphocytic infiltration between the tubules, and nodules of these massed cells assumed a lymph node structure with giant follicles observed also in the liver and ovaries. The structural characteristics led to the conclusion that the disease is a "giganto-follicular lymphoblastoma" similar to the type described in man.—T.E.G.R.

Valcarenghi, G. (1960). Su di un caso di leucemia linfatica cronica nel cane. (Osservazioni terapeutiche). [**Treatment of lymphatic leucosis in a dog.**]—Progr. vet., Torino **15,** 79-80 & 82. **1914**

Treatment with hydrochloride of methyl-2(β-chlorethylamine), injected i/v daily, and cortisone acetate i/m resulted in temporary clinical recovery; 50 days after the beginning of treatment there was a recurrence which ended fatally.—T.E.G.R.

Lemonde, P. (1959). **Influence of fighting on leukemia in mice.**—Proc. Soc. exp. Biol., N.Y. **102,** 292-295. [Author's summary modified.] **1915**

In leucaemic strains of mice, lymphoid leucaemia occurs less often and later in males than females. However, in the AK mice studied, males that were isolated and did not fight died from spontaneous leucaemia at essentially the same age and in the same proportion as females, whereas fighting males died significantly later and in a lower percentage. Hence the difference between sexes is not explained by sex hormones only. An interpretation is proposed, based on adrenal corticosteroid secretion. Fighting activity should be taken into account as a factor in pathogenesis of mouse leucaemia and in the difference of incidence and survival time between male and female mice.

Bamberger, K. (1959). A tyúkleukosis elleni védekezés. [**Control of avian leucosis.**]—Mag. állator. Lapja **14,** 387-390. [In Hungarian. Summaries in English and Russian.] **1916**

As a result of intensification of poultry management in Hungary, the incidence of the avian leucosis complex (including lymphomatosis) increased from 2·5% in 1952/55 to 5·6% in 1957/58. Protection of the birds from infection alone is not entirely desirable as it increases their susceptibility. On the other hand production of resistant strains is a costly procedure, but combined application of the two principles could be rewarding. This could be achieved by including the character for resistance against avian leucosis in the progeny testing, rearing chicks up to 10 weeks in isolation from adult stock and using the eggs of breeding hens of more than 2 years of age, which by virtue of their survival prove their higher resistance, and also their eggs are less likely to contain infective agents.

—A. Sebesteny.

Löliger, H.-C. (1959). Morphologische Untersuchungen zur Systematik der Hämoblastosen des Huhnes. [**Morphological studies on classification of the haemoblastoses of fowls.**]—Arch. exp. VetMed. **13,** 467-498. **1917**

Haemoblastoses could be classified into two groups. The first group, which corresponded to the undifferentiated stage of blood formation, were reticulo-endothelial haemoblastoses, made up of leucaemic histiocyte leucosis, undifferentiated reticulosis, and myeloid reticulosis; members of this group were generally accompanied by leucaemia. In the second group were anaemic intracapillary

erythroblastosis of the pernicious type and aleucaemic extracapillary basal-cell leucosis; neither form was leucaemic.

Neurolymphomatosis was a distinct inflammatory disease of intraneural connective tissue. Iris lymphomatosis did not belong to the haemoblastoses either, but was a separate disease.—R.M.

NUTRITIONAL AND METABOLIC DISORDERS

van Reen, R., Lyon, H. W., Losee, F. L. (1959). **Urolithiasis in the rat. I. The influence of diet on the formation and prevention of calcium citrate calculi.**—J. Nutr. **69,** 392-396. **1918**

van Reen, R., Indacochea, N., Hess, W. C. (1959). **Urolithiasis in the rat. II. Studies on the effect of diet on the excretion of calcium, citric acid and phosphate.**—Ibid. [Authors' summaries modified.] **1919**

I. Rats of the NMRI-D strain formed numerous calculi on a diet containing 15% of casein and 2% of Hubbell, Mendel and Wakeman salt mixture, whereas only a few Sprague-Dawley rats showed small concretions and no Long-Evans rats developed calculi. This suggests that the MNRI-D strain is the most sensitive to dietary alterations.

The stones consisted almost entirely of calcium citrate. This type of concretion has been reported previously in rats only under conditions of extremely low phosphorus intake.

II. Rats fed diets resulting in lithiasis excreted large quantities of calcium and citric acid but small amounts of phosphate.

Rats fed diets preventing lithiasis excreted small quantities of calcium and citric acid but high levels of phosphate.

The results are discussed in relation to the formation of calcium citrate calculi.

MacFadden, D. L., Bartley, E. E. (1959). **Mode of action of antibiotics in the nutrition of the dairy calf. III. Relative effect of age, colostrum, and chlortetracycline feeding on susceptibility of intestinal coliform bacteria to phagocytosis.**—J. Anim. Sci. **18,** 1378-1387. [Authors' summary modified.] **1920**

Coliform bacteria from the faeces of calves fed chlortetracycline were more susceptible to phagocytosis than those from the faeces of normal controls. Feeding chlortetracycline reduced mortality from coliform infections in calves deprived of colostrum. The mean phagocytic index of antibiotic-fed calves increased faster and reached a maximum at an earlier age than that of normal controls.

Lang, J. M., Roy, J. H. B., Shillam, K. W. G., Ingram, P. L. (1959). **The effect of giving stilboestrol and chlortetracycline to colostrum-fed calves.**—Brit. J. Nutr. **13,** 463-467. [Authors' summary modified.] **1921**

New-born bull calves given colostrum were used to establish the effect of 1·5 mg. stilboestrol and 125 mg. chlortetracycline by mouth daily.

Stilboestrol had no effect on incidence of scouring or mortality, and only a slight, non-significant, effect on growth rate.

Chlortetracycline, with or without stilboestrol, significantly reduced mortality associated mainly with localized intestinal infection with *Escherichia coli* and increased the weight gain of surviving calves.

Barnes, R. H., Kwong, E., Fiala, G., Rechcigl, M., Lutz, R. N., Loosli, J. K. (1959). **Dietary fat and protein and serum cholesterol. I. Adult swine.**—J. Nutr. **69,** 261-268. **1922**

Barnes, R. H., Kwong, E., Pond, W., Lowry, R., Loosli, J. K. (1959). **Dietary fat and protein and serum cholesterol. II. Young swine.**—Ibid. 269-273. **1923**

I. Dietary fat increased the cholesterol content of the serum in adult pigs and rats. Butter and beef tallow caused bigger increases than olive oil and maize oil. Protein at 13·7% or 4·9% of the diet did not influence serum cholesterol. In pigs receiving maize oil the ratio of α to β lipoproteins in the serum was 37 : 63.

II. The cholesterol content of the serum in newly weaned pigs was increased by giving beef tallow as 10% of the diet or by reducing the protein content. A peak cholesterol content was reached in the 4th or 8th week of feeding the test diets followed by a gradual decline in the following 30 weeks. Those receiving a diet both poor in protein and containing 10% tallow had the highest serum cholesterol content and also showed clin. protein deficiency. The ratio of α to β lipoproteins in the serum seemed to be unrelated to the cholesterol content.—M.G.G.

Coombe, J. B. (1959). **The effect of supplementation with urea and molasses on the liveweight, appetite and wool growth of sheep.**—J. Aust. Inst. agric. Sci. **25,** 299-301. **1924**

The feeding of a urea and molasses

supplement to Corriedale wethers on a straw diet increased the intake of straw by about 45%, and maintained the liveweight of the sheep, when, without the supplement they lost about 2 lb. per week. The wool yield was increased, though not always significantly. These results were not produced by supplementation with molasses only, nor were they significantly changed by increasing the urea supplement from 15 g. to 30 g. per sheep per day.—A. Culey.

Beames, R. M. (1959). **A note on the effect of molasses on liver copper concentrations in cattle.**—Qd. J. agric. Sci. **16,** 233-237. [Author's summary modified.] **1925**

Three groups of four heifers were fed for 16 weeks on either low quality hay, hay plus molasses, or hay plus molasses and urea. The last two treatments significantly depleted liver copper concentrations, while the first did not.

Moule, G. R., Sutherland, A. K., Harvey, J. M. (1959). **Occurrence and correction of copper deficiency of sheep in North-Western Queensland.**—Qd. J. agric. Sci. **16,** 93-119. **1926**

Three trials are described in which sheep were treated with copper sulphate or copper glycinate at different intervals. Both treatments improved liver copper status and reduced the incidence of copper deficiency lesions in fleeces but had no effect on body weight, greasy and clean fleece weight, reproductive performance, birth weight, neonatal mortality or growth rate of lambs to marking.
—T. Grainger.

Burley, R. W., Horden, F. W. A. (1959). **Experiments on wool from copper-deficient sheep.**—Nature, Lond, **184,** Suppl. No. 22 pp. 1725-1726. **1927**

From dissolution and fractionation experiments it is thought that copper deficiency in sheep is associated with a decrease in the proportion of certain sulphur-rich proteins in wool fibres. Oxidation of keratin shows that dissolved proteins may be divided into a major slightly acid-soluble component with low sulphur content, and a minor highly acid-soluble component with high sulphur content. Copper-deficient wool contains 12% less of the soluble component and 12% more of insoluble component. It is suggested that copper-deficient wool contains less of the hypothetical low-molecular-weight sulphur-rich "intermolecular cementing substance" than normal wool, affecting the physical properties of the wool.
—Brenda M. Wilson.

Gracey, J. F., Todd, J. R. (1959). **Experiments on the cobalt nutrition of sheep using heavy cobalt oxide pellets.**—Brit. vet. J. **115,** 359-364. [Authors' summary modified.] **1928**

Experiments are described in which dosing lambs with heavy cobalt oxide pellets was studied in (a) the Mourne area and (b) the Antrim plateau area in Northern Ireland.

In both areas the cobalt-treated groups gained about 4 lb. more per head than the controls. In (b) phenothiazine treatment had no effect on body weight, and neither cobalt nor phenothiazine had an appreciable effect on stomach or intestinal worm burdens of the lambs.

Carone, F. A., Epstein, F. H., Beck, D., Levitin, H. (1960). **The effects upon the kidney of transient hypercalcemia induced by parathyroid extract.**—Amer. J. Path. **36,** 77-103. [Authors' summary modified.] **1929**

Hypercalcaemia of brief duration induced in dogs by the administration of parathyroid extract for only one day produced structural alterations in the kidneys in the ascending limb of Henle, the distal convolution, and the collecting system.

Hypercalcaemia of 24 hours' duration produced severe impairment of renal concentrating ability. In most animals there was a drop in glomerular filtration rate and a rise in blood urea nitrogen which was related to the degree of intratubular obstruction. It is stressed that in clinical practice every effort should be made to correct and avoid hypercalcaemia and maintain the serum calcium within the normal range.

Davis, G. K. (1959). **Effects of high calcium intakes on the absorption of other nutrients.**—Fed. Proc. **18,** 1119-1123. **1930**

From a review of the literature, it appears that raising the Ca content of the diet above 1% decreases sharply the absorption of protein, fat with a high melting point, vitamins, P, Mg, Fe, I, Zn, and Mn. A possible mechanism is that Ca, particularly $CaCO_3$, increases the pH of the intestinal tract and alters the solubility of nutrients. In ruminants, excess Ca may lower the efficiency of the rumen micro-organisms by rendering trace elements unavailable.—M.G.G.

McAleese, D. M., Forbes, R. M. (1959). **Experimental production of magnesium defi-**

ciency in lambs on a diet containing roughage. —Nature, Lond. **184,** Suppl. No. 26 pp. 2025-2026. **1931**

Nine lambs 4–10 weeks old were fed roughage containing only 0·02% Mg. Within 45 days the serum Mg declined to 0·4–0·7 mg.% and Ca to 6·5 mg.%. All except one developed convulsive tetany. Feeding additional Ca and vitamin D had no effect on the Mg and Ca content of the serum. In a lamb inoculated with a calcium-aluminium gluconate preparation the serum Ca became normal, and the serum Mg rose to 1·4 mg.% for 10 days, falling to 0·5 mg.% after 21 days. Slight decreases in serum Mg occurred in lambs fed a ration containing 0·08% Mg or 75% lucerne with a Mg content of 0·23%, but these were regarded as seasonal variations.—M.G.G.

Cox, E. V., Meynell, M. J., Gaddie, R., Cooke, W. T. (1959). **Inter-relation of vitamin B_{12} and iron.**—Lancet December 5th, 998-1001. **1932**

Normoblastic anaemia in 13 patients with iron deficiency was associated with a low serum content of vitamin B_{12}. This rose to normal during about 10 weeks of iron treatment. In 3 patients treated for repeated alimentary bleeding the low vitamin B_{12} content of the serum gradually returned to normal in 10–18 days. On the other hand, in 15 patients with similar conditions but in whom the vitamin content of the serum was normal, iron therapy caused a sharp rise in B_{12} content followed by fluctuations during the period of blood regeneration.—M.G.G.

Csontos, J., Prohászka, L. (1959). Az A-hypovitaminosis szerepe a szopósmalacok megbetegedésében. **[Vitamin A deficiency in relation to piglet diseases.]**—Mag. állator. Lapja **14,** 266-269. [In Hungarian. Summaries in English and Russian.] **1933**

The vitamin A content of the blood and milk of Large White sows, and the liver of their piglets (1–7 days old) was estimated in several herds by the Carr-Price technique.

In a herd of 22 sows where half the piglets died from *Escherichia coli* enteritis, the vitamin A content of the milk and blood of 12 sows varied between 0–10 units/100 ml., while no traces of the vitamin were found in the livers of piglets. The sows had not been receiving adequate supplies of vitamin A from the end of the 1st month of pregnancy.

In another herd where piglet losses were normal, vitamin A values of 15–20 units/100 ml. in the blood and milk of sows and 30–60 units/g. in the livers of piglets were found.

On the other hand, in the livers of piglets from a different herd amongst which there was a high incidence of *E. coli* enteritis, vitamin A values of 25–60 units/g. were observed.

In 3 sows vitamin A deficiency was experimentally produced during pregnancy. In their milk vitamin A values of 5, 5 and 8 units/100 ml. were found. *E. coli* enteritis occurred in the litter of one of these sows; and the livers of the dead piglets contained 5 units/g. vitamin A.

It is suggested that vitamin A deficiency may be a predisposing cause of *E. coli* enteritis in new-born piglets, and that this may be assumed when the vitamin A content of the liver is below 10 units/g.—A. Sebesteny.

Grünberg, W. (1960). Untersuchungen über den Vitamin-E-Gehalt von Nebenniere, Bauchfett, Leber und Muskulatur bei Kümmerferkeln. Vorläufige Mitteilung. **[Vitamin E content of adrenals, fat, liver and muscle in stunted piglets.]**—Dtsch. tierärztl. Wsch. **67,** 37-41. [Summary in English.] **1934**

In normal slaughtered pigs the vitamin E content of adrenals averaged 26·8 mg.%, of abdominal fat 24·2 mg.%, of liver 2·3 mg.% and in muscle 1·6 mg.%. In runts values were considerably lower.—E.G.

Bieri, J. G. (1959). **An effect of selenium and cystine on lipide peroxidation in tissues deficient in vitamin E.**—Nature, Lond. **184,** Suppl. No. 15 pp. 1148-1149. **1935**

Two vitamin E deficiency syndromes in the chick are preventable by nutrients other than α-tocopherol: exudative diathesis by selenium, and muscular dystrophy by cystine, methionine or vitamin E, (selenium being ineffective). Since tocopherol is an antioxidant, it appeared that these other nutrients affect peroxidation of unsaturated fatty acids. In a series of experiments the author found that dietary selenium and cystine significantly reduced peroxidation in certain tissues of vitamin E-deficient chicks; that they acted independently and that they in some way altered the composition of tissues so that the capacity to peroxidize lipids was reduced.

—E.V.L.

Lindner, H. R. (1959). **Blood cortisol in the sheep: normal concentration and changes in ketosis of pregnancy.**—Nature, Lond. **184,** Suppl. No. 21 pp. 1645-1646. **1936**

Plasma cortisol concentrations of 13 of 14 healthy pregnant ewes which survived a

fast of four to eight days remained below 1·5 μg./100 ml. In 22 ewes in which ketosis of pregnancy had been diagnosed the concentration rose to 4·3 μg./100 ml. In 6 moribund ewes in which diagnosis was uncertain, concentrations ranged from 1·5–3 μg./100 ml. Experimental maintenance of cortisol level at 2–3 μg./100 ml. inhibited the growth of wool. It is unknown whether the increased cortisol concentration in diseased ewes is due to adrenal response or to impaired ability of the ewe to metabolize and excrete the hormone on account of severe fatty infiltration of the liver. Preliminary observation showed that conjugated reduced derivatives or cortisol were still present in considerable concentrations in bile in the terminal stage of the disease.

—Brenda M. Wilson.

DISEASES, GENERAL

Secchi, A., Marrocchi, I. (1960). La novobiocina in veterinaria e le sue associazioni. **[Novobiocin in veterinary practice.]**—Progr. vet., Torino **15,** 120-122 & 124. **1937**

Novobiocin, administered orally or parenterally, gave satisfactory results in: gangrenous mastitis of sheep (6/8); pustular dermatitis of the udder in sheep (9/9—novobiocin powder was applied topically in some cases); staphylococcal mastitis in cows (6/6); bronchopneumonia of calves (2/6—the other 4 had to be treated with other antibiotics and chemotherapeutic agents); navel-ill in calves (5/5); inflammatory conditions in cattle (3/3); deep seated abscess in a dog. Good results are claimed for treatment of swine erysipelas with a combination of novobiocin and penicillin [no details given].

—T.E.G.R.

Grant, C. A. (1960). Hepatosis diaetetica, vaxartad skelettmuskeldegeneration och "plötslig hjärtdöd". Några synpunkter på etiolog och patogenes. **[Hepatosis diaetetica, waxy skeletal-muscle degeneration and fatal syncope. Aetiology and pathogenesis.]**—Medlemsbl. Sverig. VetFörb. **12,** 13-16. [In Swedish.] **1938**

The three conditions were found together in various combinations in the same herd (sometimes in the same pig) in nearly two-thirds of a large routine material from growing pigs in Sweden in 1959. Studies in progress since 1957 on the prophylactic and therapeutic effects of selenium salts on hepatosis diaetetica showed that while selenium prevented liver lesions, both "yellow fat" and waxy skeletal-muscle degeneration occurred in control and treated pigs alike. Liver necrosis in experimental pigs was usually accompanied by transudations, vascular and heart lesions characteristic of fatal syncope. Findings were similar in pigs fed poor quality grain.—F.E.W.

Mills, C. F., Fell, B. F. (1960). **Demyelination in lambs born of ewes maintained on high intakes of sulphate and molybdate.**—Nature, Lond. **185,** 20-22. **1939**

Eight ewes aged 2 years were divided into 2 groups after mating and kept on a diet of: (a) 1 kg. commercial grass cubes (copper content 5 μg./g.) with sodium sulphate to provide an intake of 10 g. sulphate; (b) 1 kg. grass cubes supplemented as (a) above plus ammonium molybdate to give an intake of 50 mg. molybdenum/day. One month before lambing the food was increased to 1·2 kg./day. Purified tap water was constantly available. One ewe in the first group died after 18 weeks and the others lambed normally. When twin lambs were born one was killed at birth for liver-copper analysis. Incoordination of the hind legs progressing to the fore legs developed in one lamb of the second group within 3 days of birth and in two of the remaining 3 at 18 and 60 days respectively. These lambs, killed for examination, showed no macroscopic lesions. Microscopic lesions were found in the cerebral hemispheres, mesencephalon and cervical portion of the spinal cord. The myelin of the cerebral subcortex was beaded or lost in diffuse areas where the brain tissue was spongy with marked pericellular and perivascular spaces. In the spinal cord there was symmetrical diffuse demyelination in the dorso-lateral columns of white matter and in the ventro-lateral and central columns up to the median fissure. There was no cuffing or cellular reaction suggestive of infection. The lesions observed closely resemble those of swayback. Results of copper determinations on livers from ewes and lambs are given in tabular form and discussed.—T.E.G.R.

Gwatkin, R., L'Ecuyer, C. (1960). **Rhinitis of swine. XIV. Haematology of infected and normal pigs.**—Canad. J. comp. Med. **24,** 6-9.

[Summary in French. Abst. from authors' summary.] **1940**

Haematological studies revealed no differences in the cellular elements in pigs with rhinitis and normal controls.

Di Domizio, G. (1959). Modificazioni del ciclo di Krebs nella malattia degli edemi dei suini come espressione di lesione biochimica del sistema nervoso centrale. **[Changes in the Krebs cycle associated with nervous lesions in oedema disease of swine.]**—Acta med. vet., Napoli **5,** 317-324. [Summaries in English and French.] **1941**

Biochemical changes in the brain of pigs with oedema disease were studied in brain slices. It was observed that there was faulty metabolism of citric and pyruvic acids.

—T.E.G.R.

Bronsch, K., Kämpf, P. (1960). Therapieversuche zur Bekämpfung der Oedemkrankheit, zugleich ein Beitrag zur Behandlung ernährungsbedingter Stoffwechselstörungen der Schweine. **[Treatment of oedema disease in swine.]**—Dtsch. tierärztl. Wschr. **67,** 88-93. [Summary in English.] **1942**

Symptoms of oedema disease in pigs fed mainly on steamed potatoes regressed in 91% of cases after a single i/m injection of 10–50 mg. prednisolone, together with antibiotics and vitamins A and D_3, and deprivation of food and water for 2 days before feeding a nourishing ration. In untreated pigs mortality was over 90%.—M.G.G.

Ringarp, N. (1960). **Clinical and experimental investigations into a post-parturient syndrome with agalactia in sows.**—Acta agric. scand. Suppl. No. 7 pp. 166. [In English.] [Thesis, Stockholm.] **1943**

A full account of investigations into toxaemic agalactia and its treatment with prednisolone, with 13 photomicrographs. This work was previously abstracted from a Swedish version [*V.B.* **29,** 2888].—R.M.

Gerriets, E. (1959). Experimentelle Untersuchungen zur Ätiologie der Ballengeschwülste. **[Aetiology of bumblefoot.]**—Arch. Geflügelk. **23,** 417-422. [Summary in English.] **1944**

Bumblefoot was not induced in 180 fowls divided into groups which were subjected for 9 or 12 months to one of the following conditions: stone floors, either bare or strewn with sand, perches with sharp edges, 5% cooking salt or 30% fish meal in the ration, puncture of the balls of the feet with a hollow needle, and implantation of thorns. Bumblefoot, which has a peak incidence around July at the end of the laying period, is thought to be an endogenous metabolic disorder.

—M.G.G.

van Bogaert, L. (1960). **Neurologic diseases of bears in captivity.**—J. Neuropath. **19,** 89-95. [Author's summary modified.] **1945**

Toxic encephalopathy which occurred during acute hepato-nephritis in a Himalayan bear was characterized by rapidly-progressing drowsiness and myoclonus.

In two American or Baribal bears *(Ursus americanus)* disseminated meningo-encephalitis with glial nodules or diffuse glial involvement was manifested by disturbances in behaviour, clonic and epileptiform seizures. Illness lasted about a month. Viscera were normal.

Robertson, H. A., Falconer, I. R. (1959). **Accumulation of radioactive iodine in thyroid glands subsequent to nuclear weapon tests and the accident at Windscale.**—Nature, Lond. **184,** 1699-1702. **1946**

Examination of 77 thyroid glands from sheep grazing within the area of maximum deposition after the Windscale accident suggests that the dose of radiation received by each thyroid was somewhere between 3,000 and 4,500 rads. This figure can only be an approximation and experimental evidence has shown that changes in thyroid activity follow administration of 5,000 rads over a period of six months.—G. B. S. Heath.

Wright, E., Sinclair, D. P. (1959). **The concentration of radioiodine by the foetal thyroid gland and its relation to congenital goitre in sheep.**—N.Z. J. agric. Res. **2,** 933-937. [Authors' summary modified.] **1947**

The ability of the foetal sheep thyroid to accumulate radioiodine varies markedly during gestation. From the 60th to the 100th day of foetal age the foetal and maternal glands are similar in this respect but from the 100th to the 120th day the foetal capacity increases until it is four times greater than the maternal and continues at this level until parturition.

The ingestion of kale by the ewe is more effective in producing congenital goitre during the fourth month of pregnancy than at other times. This corresponds to the period during which the foetal gland is developing its high power of absorption of iodine.

Burns, C. H., Abrams, G. D., Brownell, L. E. (1960). **Growth, reproduction, mortality, and pathologic changes in rats fed gamma-irradiated potatoes.**—Toxicol. appl. Pharm. **2,** 111-131. **1948**

For two years a colony of rats was fed diets one-third of which consisted of potatoes which received, for the purposes of sprout inhibition, a dose of up to 40 kilorads of irradiation from reactor fuel elements. No pathological or physiological changes could be attributed to the potatoes.—R.M.

Colombo, S. (1959). Le modificazioni e gli ispessimenti dell'intima arteriosa negli animali. Studio istomorfologico ed istogenetico. **[Changes and thickening of the arterial intima in animals.]**—Clin. vet., Milano **82,** 65-92 & 113-129. **1949**

Literature on thickening of the arterial intima in man and in domestic and wild animals is reviewed and an account is given of personal observations in domestic and wild animals and birds. There are 42 photomicrographs.—T.E.G.R.

POISONS AND POISONING

Stöber, M. (1960). Zur Behandlung der Bleivergiftung beim Rind. **[Treatment of lead poisoning in cattle.]**—Dtsch. tierärztl. Wschr. **67,** 85-88. [Summary in English.] **1950**

Of 31 cattle with lead poisoning, 28 recovered after daily i/v infusion, for 3–5 days, of 20–80 ml. of 24% aq. soln. of sodium calciumedetate in saline or glucose soln.—M.G.G.

Gancarz, B. (1959). Wartość niektórych odtrutek w leczeniu zatruć talem. **[Value of antidotes in thallium poisoning.]**—Med. Wet., Warszawa **15,** 648-649. [In Polish.] **1951**

Sodium thiosulphate, potassium iodide, sodium sulphate and sodium citrate were of no value as antidotes to experimental thallium sulphate poisoning in g.pigs and a dog. Two g.pigs which vomited, thereby eliminating precipitated thallium salts from the stomach before absorption took place, survived.

—M. Gitter.

Bartík, M., Kupka, J. (1959). Polarografická diagnostika otráv kuchynskou sol'ou u domácich zvierat. **[Polarographic diagnosis of sodium chloride poisoning in domestic animals.]**—Folia vet., Košice **3,** 64-72. [In Slovak. Summaries in English, German and Russian.] **1952**

NaCl levels in liver tissue from slaughtered pigs, sheep and cattle were established by polarography, using tissue deproteinized by a 20% soln. of sulphosalicylic acid. In pigs normal values were 184± 20·9 mg.%, in sheep 164± 15·5 mg.%, and in cattle 172± 14·4 mg.%. It was stated that in bled pigs, values higher than 350 mg.% may be regarded as indicative of NaCl poisoning.—E.G.

Weidmann, S. M., Weatherell, J. A., Whitehead, R. G. (1959). **The effect of fluorine on the chemical composition and calcification of bone.**—J. Path. Bact. **78,** 435-445. [Authors' summary modified.] **1953**

Chemical analyses have shown that fluoride partly replaces the carbonate of bone-salt. Increases in the magnesium content suggest that some fluoride is probably precipitated as MgF_2. There is no evidence from the analyses that the phosphate group of bone-salt apatite is replaced by fluoride or that any appreciable amounts of CaF_2 are precipitated. It is thought unlikely that the changes in the chemical composition of bone-salt themselves give rise to the pathological changes found in skeletal fluorosis.

Reduction in bone-salt deposition investigated by measurnig ^{32}P uptake in bones of fluorotic animals, was found only in very young kittens.

Annison, E. F., Hill, K. J., Lindsay, D. B., Peters, R. A. (1960). **Fluoroacetate poisoning in sheep.**—J. comp. Path. **70,** 145-155. **1954**

Poisoning may result from ingestion of the South African plant *Dichapetalum cymosum* or the sodium compound used to kill rats and rabbits. The lethal dose of sodium fluoracetate was 0·4 mg./kg. body wt. It was cumulative in non-lethal doses. Changes in blood lactate, glucose, ketones and fatty acids were recorded and compared with changes reported in poisoned rats and rabbits. Administration of acetates was only of limited prophylactic value. [See also *V.B.* **20,** 3094.]—R.M.

Lettow, E. (1960). Fermentdiagnostik des Tetrachlorkohlenstoffschadens der Leber beim Hund. **[Enzymes in the diagnosis of carbon tetrachloride damage in the liver in dogs.]**—Berl. Münch. tierärztl. Wschr. **73,** 25-27. [Summary in English.] **1955**

A discussion on the value of changes in serum transaminase activity for the estimation of liver damage in dogs poisoned by CCl_4.

—E.G.

Schoental, R., Magee, P. N. (1959). **Further observations on the subacute and chronic liver changes in rats after a single dose of various pyrrolizidine (Senecio) alkaloids.**—J. Path. Bact. **78,** 471-482. [Authors' summary modified.] **1956**

Subacute and chronic liver lesions were observed in rats after appropriate single oral doses of the pyrrolizidine alkaloids, heliotrine, lasiocarpine and its N-oxide, retrorsine, riddelliine and seneciphylline. Repeated liver biopsies indicated that these lesions could occur without preceding zonal necrosis.

Similar subacute liver lesions also occurred after monocrotaline and its N-oxide, but more commonly the changes were predominantly congestive in the centrilobular areas. Occasionally fibrous thickening of the central veins was seen with narrowing of the lumina.

Changes in the lungs were almost invariably present after mono-crotaline and its N-oxide, but were quite common after the other alkaloids.

The origin and fate of the enormous liver parenchymal cells characteristic of the subacute lesions are discussed.

Lewandowski, L., Kutrowski, W. (1959). Zatrucie jałowek starcem jakubkiem (Senecio jacobaea L.). **[Senecio jacobaea poisoning in heifers.]**—Med. Wet., Warszawa **15,** 518. [In Polish.] **1957**

An account of an outbreak in which 12 yearling heifers were affected after feeding for a few days on a new consignment of hay. Clinical symptoms were diarrhoea, lacrimation, apparent blindness and ataxia. One animal died, 2 had to be slaughtered and P.M. examination revealed gastro-enteritis, enlarged, congested liver and petechiae on serous surfaces. Bacteriological examination proved negative and about 5% of *S. jacobaea* was found in the hay. The remaining animals recovered within 3 days after a change of hay and administration of purgatives.—M. Gitter.

Jackson, J. B., Ivey, M. C., Roberts, R. H., Radeleff, R. D. (1959). **Residue studies in sheep and goats dipped in 0·025% lindane.**—J. econ. Ent. **52,** 1031-1032. **1958**

4 sheep and 4 goats were dipped in 0·025% lindane and biopsy specimens of omental fat examined fortnightly from two animals in each group. Sheep had slightly higher residues than goats, the highest, 2 weeks after dipping, averaging 4·22 and 2·67 p.p.m., respectively. Residues decreased steadily to 0·27 and 0·18 p.p.m. after 10 weeks, and zero after 12 weeks. No toxic symptoms were observed.—W. N. Beesley.

Gaines, T. B. (1960). **The acute toxicity of pesticides to rats.**—Toxicol. appl. Pharm. **2,** 88-99. **1959**

Lethal doses of 44 compounds given by mouth or applied to the skin of rats were determined. They included aldrin, dieldrin, chlordane, DDT, toxaphene, diazinon, Dipterex, malathion, parathion, ronnel and Bayer 21/199. The dimethylcarbamate compound Isolan was unusual because it was more toxic when absorbed through the skin than given by mouth.—R.M.

See also abst. **2031** (report, Australia).

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease.)

Geyer, R. P. (1960). **Parenteral nutrition.**—Physiol. Rev. **40,** 150-186. **1960**

A review of 659 publications which deal with the chemical and physical composition of fluids suitable for parenteral nutrition.—R.M.

Allcroft, R., Uvarov, O. (1959). **Parenteral administration of copper compounds to cattle with special reference to copper glycine (copper amino-acetate).**—Vet. Rec. **71,** 797-810. **1961**

Only three of many copper compounds tested proved effective in copper deficiency in cattle. Intramuscular injection was not recommended; brisket subcutaneous treatment was satisfactory. Absorption in liver was good, uptake varying with initial copper status, and type of feeding. Even under severe conditions, 2–3 injections per year should suffice. Injection of a cow with copper glycine 1–4 months before calving increased copper in the calf's liver. Repeated injections, totalling 3·6 g. of copper glycine, caused no toxic effects.

—F. R. Paulsen.

Westermarck, H. (1959). **Digitalis inactivation in vitro due to rumen microbes from sheep.**—Acta vet. scand. **1,** 67-73. [In English. Summaries in German and Swedish.] **1962**

When digitalis is given orally to sheep,

ten times larger doses are required for a given effect than when administered intravenously. Up to 73% of a dose of digitalis was inactivated by rumen fluid from a sheep fed cattle feed, whilst slightly less was inactivated by rumen fluid from sheep fed straw and hay. Inactivation was almost completely inhibited if chlortetracycline was added to the mixture of digitalis and rumen fluid before incubation.
—A. Ackroyd.

Colombi, C. (1959). L'associazione di cloramfenicolo e tetraciclina in terapia clinica. **[Chloramphenicol-tetracycline therapy.]** —Gazz. Vet., Milano No. 4. pp. 1-3. **1963**

Chloramphenicol-tetracycline was administered to 85 calves with diarrhoea or bronchopneumonia and to 32 dogs with gastro-enteritis or bronchopneumonia. Clinical recovery occurred 76 calves and 25 dogs.—T.E.G.R.

Gladenko, I. N., Fortushnyi, V. A. (1959). **[Influence of biomycin (chlortetracycline) and levomycetin (chloramphenicol) on higher nervous activity of rats.]**—Nauch. Trud. Ukrain. Inst. eksp. Vet. **25,** 67-82. [In Russian.] **1964**

In oral doses (administered by stomach tube) of 25 mg./kg. body wt. each antibiotic depressed the activity of the cerebral cortex, as shown by the delayed response of rats to conditioned reflexes. Doses of 5–10 mg./kg. had no inhibitory effect. The authors suggested that the inhibition enhanced the therapeutic efficacy of the drugs.—R.M.

Bassignana, G. (1959). Le possibilità pratiche di impiego del "Prednisolone" nel cavallo da corsa. **[Uses of prednisolone in racehorses.]** —Progr. vet., Torino **14,** 759-760. **1965**

Prednisolone was used to treat bursitis (125–250 mg. doses, repeated at 8–10 days), tarsal tenosynovitis (500 mg.), synovitis (125 mg., 6-day intervals), haematoma, and similar conditions in racehorses. Results were generally favourable, provided ample rest was allowed.—F. R. Paulsen.

van der Schaaf, A., Jaartsveld, F. H. J., van Maanen, A. M. (1960). Proeven over ontsmetting van de huid. II. **[Experiments on disinfection of the skin. II.]**—Tijschr. Diergeneesk. **85,** 185-196. [In Dutch. Summaries in English, French and German. English summary modified.] **1966**

Chlorhexidine and cetrimide in a conc. of 1% and different chloramines in a conc. of 0·4% were the only antiseptics of a number tested which could kill within 3 min. *Staphylococcus aureus, Salmonella dublin* and *Brucella abortus* (Strain 19) on and in the superficial layers of the skin without irritating the epidermis.

Bacterial spores could not be killed even by the highest concentrations of disinfectants within a short time.

The proteins of milk partly inhibit the disinfecting capacity of chloramine and to a lesser degree that of chlorhexidine.

Chlorhexidine diacetate is precipitated and inactivated by sodium chloride in physiological concentrations and by urine.

The Rideal-Walker test is less suitable for testing antiseptics for the human or animal skin than the "teat-test" described previously [*V.B.* **26,** 1252] which is simple and gives reproducible results even with disinfecting pastes and barrier creams.

See also absts. **1691** (sensitivity to antibiotics of **E. rhusiopathiae** and **E. monocytogenes**); **1700** (colimycin in calf diarrhoea); **1745**, **1749** (griseofulvin); **1751** (potassium iodide in avian aspergillosis); **1752** (isoniazid in actinobacillosis); **1757** (deoxycortone in chronic respiratory disease); **1760-1761** (drug resistance in trypanosomes); **1768** (toluidine blue in avian coccidiosis); **1797** (isatin-beta-thiosemicarbazone in mouse pox); **1801** (influenza); **1868-1869, 1873-1877, 1883-1886, 1958 1959 & 1985** (parasiticides); **1888-1890, 1900, 1903, 1906-1908 & 1955** (anthelmintics); **1937** (novobiocin); **1950** (treatment of lead poisoning in cattle); **1951** (antidotes against thallium poisoning); **2037-2038** (books, veterinary pharmacology).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

Aoki, T., Kimura, S., Wada, M. (1959). **On the responsiveness of the sweat glands in the horse.**—J. invest. Derm. **33,** 441-443. [Authors' summary modified.] **1967**

The responsiveness of horse sweat glands to i/d inj. of ten sudorific agents was determined. Responses to sympathomimetic and parasympathomimetic agents were blocked by dihydroergotamine methanesulphonate and by atropine respectively. There was no evidence of axon reflex sweating.

Guth, P. S. (1959). **Kinins produced from bovine colostrum by kallikrein and saliva.**—Brit. J. Pharmacol. **14,** 549-552. [Author's summary modified.] **1968**

Kallikrein is a substance occurring in the urine, pancreatic juice and saliva of many animals (Frey, Kraut & Werle, 1950). Its properties indicate that it is an enzyme or mixture of enzymes similar to but not identical with trypsin.

Substances capable of stimulating smooth

muscle are produced on the incubation of bovine colostrum with urinary kallikrein or calf saliva. These colostrokinins have been differentiated from kallidin, substance A and similar smooth-muscle activating agents. Salivary colostrokinin is probably formed in the unweaned calf. As colostrum became milk, the ability to form colostrokinin diminished. A function for salivary colostrokinin in the new-born is suggested.

Wright, D. E. (1960). **Pectic enzymes in rumen protozoa.**—Arch. Biochem. **86,** 251-254. **1969**

The hydrolysis of pectin by extracts of protozoa to methanol, and demethylated pectin demonstrated the presence of pectin esterase. Polygalacturonases were also present. These findings may be of importance in connexion with the role of pectins in tympanites.—R.M.

Graham, N. McC., Wainman, F. W., Blaxter, K. L., Armstrong, D. G. (1959). **Environmental temperature, energy metabolism and heat regulation in sheep. I. Energy metabolism in closely clipped sheep.**—J. agric. Sci. **52,** 13-24. **1970**

Blaxter, K. L., Graham, N. McC., Wainman, F. W., Armsrong, D. G. (1959). **Environmental temperature, energy metabolism and heat regulation in sheep. II. The partition of heat losses in closely clipped sheep.**—Ibid. 25-40. **1971**

Blaxter, K. L., Graham, N. McC., Wainman, F. W. (1959). **Environmental temperature, energy metabolism and heat regulation in sheep. III. The metabolism and thermal exchanges of sheep with fleeces.**—Ibid. 41-49. **1972**

1. The heat emission of two closely clipped sheep fed dried grass cubes was studied at environmental temperatures ranging from 8° to 38°C. The sheep shivered at temperatures below 23°C. As temperatures increased, water consumption and urinary volume increased markedly but the cooling due to this was small. The basal loss of heat by vaporization of water was 316 and 307 Cal./sq. metre/24 hours in the two sheep. Vaporization increased at environmental temperatures of 31°, 27° and 26° respectively for low, medium and high levels of feeding.

Heat production above the critical temp. appears to be related to the inefficiency of vaporization. The sensible loss of heat decreased as environmental temp. rose and the rate of body cooling below or warming above the critical temp. was about 10 Cal/sq. m./24 hours/°C. change in environmental temp. Loss of heat by radiation increased with decreasing environmental temperature and loss by convection was slightly increased during shivering and panting. Thermal conductance of the tissues increased with environmental temp., being at its minimum immediately before shivering and actually rising again with shivering.

II. The energy exchanges of two wethers were determined in a closed circuit respiration chamber at environmental temp. between 8° and 38°C. The sheep were closely clipped at weekly intervals. Weight losses were greatest at the lowest temperatures. Fleece growth was at its maximum at about 28°C. but was depressed by low feeding. Changes in environmental temp. produced only small changes in the energy lost in faeces and urine and as methane. Heat production was related closely to environmental temp. The critical temp. (*i.e.*, the temp. at which heat production is minimal) was 39° to 40° for the lowest feeding level, and 24° to 27° for the highest level. Energy retention varied greatly with temp. and level of feeding. It was negative for all feeding levels at temperatures below 15° and at the low feeding level irrespective of temp.

III. In 15 calorimetric experiments with 3 sheep (fleece lengths from 2·5 to 12 cm.) on a ration of 1,200 g. of dried grass cubes daily, environmental temperatures ranged from 11° to 40°C. The metabolizable energy of the food increased with environmental temp. by only 2–3 Cal./24 hours/°C. Irrespective of fleece length, heat production remained constant between 15° and 35°C. Above 35° an increase occurred in all cases; below 11° a slight rise occurred in the sheep with a fleece length of 2·5 cm. Below 40° heat losses by vaporization of water were greater the longer the fleece, but the values converged at 40°. Sensible heat losses were greatly reduced by the presence of a fleece, and above the critical temp. most of the heat was lost from the hair-covered regions. The thermal conductivity of both fleece and hair was determined *in vivo*. A method is given for calculating the critical temperatures of sheep with different lengths of fleece.—E. J. Castle.

Garton, G. A. (1960). **Lipid metabolism in herbivorous animals.**—Nutr. Abstr. Rev. **30,** 1-16. **1973**

A review of the literature on digestion and absorption of lipids and the lipids in tissues, blood and milk.—R.M.

Denamur, R., Martinet, J. (1960). **Physiological mechanisms concerned in the maintenance of lactation in the goat and sheep.**—Nature, Lond. **185,** 252-253. **1974**

Reference is made to previous personal work on the maintenance of milk secretion in sheep and goats. Further experiments on the denervation of the mammary gland were carried out: (1) severance of all connexion between the mammary gland and the body except the inguinal blood vessels, with perivascular sympathectomy of inguinal blood vessels, followed by suturing of the gland back into position; (2) section of the spinal cord at *T* 11 with (bilateral sympathectomy and splanchnicectomy) and removal of the spinal cord between *T* 11 and *L* 5; (3) nerve section, resulting in insensitivity of the mammary gland and adjacent areas. Milk yields were recorded over periods of 25-40 weeks but results for only the first 15 weeks are given, in order to eliminate any effects of possible regeneration of the perineal nerves. Results confirmed previous experiments and it is considered that the milk-ejection reflex is not indispensable for lactation in goats and sheep since they can give substantial yields of milk in its absence.—T.E.G.R.

Fisher, E. W., Dalton, R. G. (1959). **Cardiac output in horses.**—Nature, Lond. **184,** Suppl. No. 26 pp. 2020-2021. **1975**

The cardiac output in 10 resting adult horses was 62 to 94 (average 74) ml./kg. body wt. per min.—M.G.G.

Sturkie, P. D., Vogel, J. A. (1960). **Cardiac output, central blood volume and peripheral resistance in chickens.**—Amer. J. Physiol. **197,** 1165-1166. **1976**

Cardiac output, determined by a dye-dilution method, of 36 adult White Leghorns averaged 143 ml./kg./min. for males and 173 for females. Peripheral resistance (calculated by dividing mean blood pressure by blood flow in ml. a min.) was 1·23 units per kg. body wt. in males and 0·88 units in females. Central blood volume averaged 35 ml. in males and 27 ml. in females. [See also *V.B.* **29,** 3298.] —R.M.

Mullick, D. N. (1959). **Electrocardiograph studies in normal buffaloes.**—Brit. vet. J. **115,** 416-424. [Author's summary modified.] **1977**

Electrocardiographic data for young calves (5–24 months), lactating, lactating and pregnant and dry and pregnant dairy buffaloes were given.

Electrocardiograms of buffaloes were quite different from those of man, except the intervals and length of various waves which were almost similar in the two species. In general the form and potential of the deflections were different. The values of cattle, horse, dog, sheep and man were shown for comparison.

Kraft, H. (1959). Das morphologische Blutbild von Chinchilla velligera (Prell 1934). [**Blood morphology of the chinchilla.**]—Blut **5,** 386-387. **1978**

Blood from 5 female and 10 male chinchillas was examined. Erythrocyte counts were between 8 and 11 million per cu. mm.; leucocytes 10,000–15,000 per cu. mm. There were no striking differences from the blood of other rodents.—R.M.

Sander, E. G., Warner, R. G., Harrison, H. N., Loosli, J. K. (1959). **The stimulatory effect of sodium butyrate and sodium propionate on the development of rumen mucosa in the young calf.**—J. Dairy Sci. **42,** 1600-1605. **1979**

A rumen fistula, with cannula, was made in each of 12 Holstein bull calves, 2–5 weeks of age. The calves were kept on raised wooden platforms to prevent eating of bedding and all were fed milk from nipple-pails. Five pairs received through the cannula solutions of sodium acetate, sodium propionate, sodium butyrate, sodium chloride or glucose. The solutions were given twice daily except for sodium chloride which was given slowly over an eight hour period daily to preclude toxic symptoms. The remaining pair of calves received milk only. All were slaughtered after 11 weeks' treatment except three (one on acetate, one on propionate and one on butyrate) which died from pneumonia at the 9th, 5th and 7th week respectively. The pair on butyrate showed greatest development of rumen papillae followed next by the pair on propionate. Less papillary development was shown by the sodium acetate, the glucose and the sodium chloride pairs; the controls showed least development. The authors raise the question of whether larger quantities of glucose might have produced greater papillary development.—A. Brownlee.

Webster, H. F., Spiro, D. (1960). **Phase and electron microscopic studies of experimental demyelination. I. Variations in myelin sheath**

contour in normal guinea-pig sciatic nerve.—J. Neuropath. **19,** 42-47. **1980**

Indentations of the myelin sheath into the axoplasm or protrusions into Schwann cell cytoplasm, resembling early demyelinative lesions occurred in normal g.pigs. [15 plates of photomicrographs.]—R.M.

Stokoe, W. M. (1959). **On a hitherto undescribed valvular apparatus in the adrenal gland of the sheep.**—Brit. vet. J. **115,** 408-410. [Author's summary modified.] **1981**

The lack of plain muscle in the walls of the adrenal medullary veins of the sheep is discussed. A valvular apparatus guarding the exit of the right central medullary vein into the caudal vena cava is described.

Perek, M., Eilat, A. (1960). **Effect of removal of bursa fabricii on depletion of adrenal ascorbic acid in ACTH-treated chicks.**—Endocrinology **66,** 304-305. [Authors' abst. modified.] **1982**

After ACTH injections a highly significant depletion of the adrenal ascorbic acid was obtained in the bursectomized birds; no response was noted in the chicks with intact bursae. It was concluded that the bursa of Fabricius inhibits depletion of adrenal ascorbic acid after ACTH treatment in young birds.

Höhn, E. O. (1959). **Action of certain hormones on the thymus of the domestic hen.**—J. Endocrin. **19,** 282-287. [Author's summary modified.] **1983**

Thyroxine, deoxycortone acetate (DCA), progesterone, testosterone, oestradiol, cortisone and bovine growth hormone (GH) were injected daily for 4 weeks into laying hens. Thymus weight was increased by thyroxine, decreased by cortisone and unaffected by testosterone and oestradiol. Results with DCA and progesterone were inconclusive but suggested a thymus weight-reducing action. GH increased thymus weight but not to a significant degree. Testosterone injected daily for 6 weeks into adult male mallards did not affect thymus weight.

Thyroxine and GH increased thickness of the cortex and vascularity of both cortex and medulla of the thymus. Cortisone, DCA and progesterone caused cortical atrophy. Weight of the bursa of Fabracius was not affected by any of the hormones. Egg-laying was reduced by all the hormones, but this effect was marked only with thyroxine (in one out of two experiments), oestradiol and GH.

A moult was induced by thyroxine, testosterone and GH but the effects obtained with GH may have been due to contamination with thyrotrophic hormones. It is suggested that the spontaneous late-summer enlargement of the thymus of adult wild birds is due to increased thyroid activity at this time.

Perk, K., Lobl, K. (1959). **A comparative study on the sera proteins and lipids in two breeds of cattle.**—Brit. vet. J. **115,** 411-415. [Authors' summary modified.] **1984**

Holstein-Friesian cattle showed higher total cholesterol, total protein and gamma globulin, but a lower albumin/globulin ratio than the Damascene cattle, which were adapted to the hot dry climate. Both breeds had similar alpha and beta globulin patterns.

See also abst. 2041 (book, histological technique).

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

Clifford, P. A., Bassen, J. L., Mills, P. A. (1959). **Chlorinated organic pesticide residues in fluid milk.**—Publ. Hlth Rep., Wash. **74,** 1109-1114. [Authors' summary modified.] **1985**

936 samples of raw milk from 48 dairies were examined for chlorinated organic pesticides by paper chromatography during 4 months starting in August. Twenty-three samples (2·5%) showed 0·1 p.p.m. or more.

Samples were also analysed by a fly bioassay procedure. Toxic reactions were noted in 33% of the samples (florisil column) and in 54% (MgO column).

Investigations to determine the source of residues were limited to eight producers whose milk was found to contain "substantial" residues. Of these, the source of contamination was definitely accounted for in only three cases. Feeding of DDT-contaminated maize silage (1·2 to 12 p.p.m. DDT) was responsible for high residues in one case. Contamination in the other two cases was traced to the careless spraying of barns with a concentrated DDT solution.

Artioli, D. (1959). Gastroenterite da salmonelle, da stafilococchi enterotossici e consumo di carne fresca o conservata. **[Meat as a source of salmonella and staphylococcal gastroenteritis in man.]**—Nuova Vet. **35,** 160-166. **1986**

The author states that many outbreaks allegedly due to meat are due to other factors. For salmonella the incubation period is never less than 5 hours and may even be 72; the average is 12–24, no thermo-resistant toxin is produced and disease can only be caused by the ingestion of living organisms. *Staphylococcus aureus* does not produce enterotoxin in fresh meat, which is not a suitable substrate, but it can do so in salted, dried, or smoked meat. Acute gastro-enteritis caused by meat of any description is, he claims, quite rare.—W. K. Dunscombe.

Morre, J. (1959). Méthode originale de mesure de la radio-activité des aliments d'origine animale. **[New method for measuring radioactivity in foodstuffs of animal origin.]**—Bull. Acad. vét. Fr. **32,** 357-362. Discussion: pp. 362-364. **1987**

M. described an apparatus for the detection of radio-activity in foodstuffs of animal origin. 1 kg. of the fresh product is dried to powder, 100 g. mixed with a synthetic binding product and a few ml. $CHCl_3$ and compressed at 50 kg./sq. cm. in a specially made steel mill, cooled, and then placed in a lead container and the beta and gamma radiation counted by Geiger counter. The procedure takes at least 24 hours but the mill is easy to decontaminate. M. stated that about 100 examinations of fish, shell-fish, milk powders, dried bone etc. had been carried out already. Replying to discussion, M. admitted that additional apparatus was required to count alpha radiations. The tendency of radio-caesium to localize in muscle was pointed out.—W. K. Dunscombe.

Freund, S. (1959). **The Government Veterinary Services during the first ten years of the existence of the State [of Israel-Ed.]**—Refuah vet. Special Issue. pp. 6-14. [In English.] **1988**

Owing to the extensive land frontiers the possibility of the spread of disease from neighbouring countries is always present. For brucellosis, Strain 19 vaccination of calves and of adult cows is used. For tuberculosis there are provisions for slaughter and compensation. Protozoal diseases are still prevalent as is F.& M. disease (types O, A and C, and also an Asian strain which was recently responsible for an outbreak with certain atypical manifestations). Here vaccination of all cattle seems to be the only economically feasible method of control at present. Rabies is common in wild carnivora and in ruminants such as gazelle, sheep, and goats. Vaccination of dogs with the Flury vaccine and more recently with the Kelev strain has been satisfactory.

—W. K. Dunscombe.

Chen Shao-Dyan & Alenkovich, A. A. (1959). **[Organization of veterinary services in the Chinese People's Republic.]**—Veterinariya, Moscow **36,** No. 10 pp. 70-77. **1989**

This is the most detailed account of Chinese veterinary services that has appeared in recent years.

In 1950 there were 200 zootechnical-veterinary stations and by the end of 1957 there were 2,776 employing 22,000 persons. Apparently the stations were staffed by "zootechnicians", "veterinary workers" and "people's veterinarians" all of whom had undergone only 6 months' training. In 1956 there were 164,000 "people's veterinarians" and 300,000 "veterinary sanitary officials" (estimated to increase to a million in 1958). Additional services, presumably staffed by more highly-trained persons, included 300 state veterinary clinics, 120 veterinary transport control stations and 83 veterinary diagnostic laboratories.

Research was done at 13 veterinary, zootechnical-veterinary and agricultural institutes. The chief one was the All-China Veterinary Research Institute at Harbin. Here research was being done on adaptation of lapinized rinderpest virus to sheep and goats in order to reduce its virulence for Korean cattle, yaks and yak-cow hybrids; adaptation of lapinized swine fever virus to sheep and goats; vaccines against sheep pox, lapinized vaccine against bovine contagious pleuropneumonia. A new type of foot and mouth disease virus had been named "ZB type" (from initials standing for China-Baoshan). Combined vaccines had been prepared against swine fever and pasteurellosis and against swine fever and erysipelas. Orchitis in boars was attributed to Japanese B encephalitis virus.

Poisoning of cattle was attributed to batatas (sweet potato) contaminated with the fungus *Corastostomella fimbriata.* Horses, donkeys and mules were poisoned by maize contaminated with *Fusarium martii* var. *minus.*

It was planned that in 1959 each province would have a biological products laboratory. Existing laboratories made a range of 44 biological products. 37 vacuum apparatuses were installed during 1958 to make dried vaccines and sera. In addition 3 foot and mouth disease laboratories were producing monovalent ad-

sorbed formolized vaccine by the Russian method of Ratner & Gribanov.—R.M.

Maïdar, D. (1959). **[History of development of veterinary medicine in Mongolia.]**—Veterinariya, Moscow **36,** No. 10 pp. 77-80. **1990**

While in 1924 there was one veterinary surgeon to every 3 million animals, in 1954 there was one to every 23,000 animals [total number of veterinary surgeons not given]. A veterinary faculty at the Mongolian State University opened in 1942. Biological products were made at three institutes at Songinsk, Tsetserlik and Kobdo. Unspecified control measures for rinderpest were applied to 133,000 cattle in 1952, and for bovine contagious pleuropneumonia to 46,200 cattle. It was estimated that in 1956 about half the livestock population were covered by measures designed to control disease, compared with one-fifth in 1946. Glanders was still present in horses.—R.M.

See also absts. **1677** (inquiry on anthrax, Great Britain); **1737** (bacteriology of goats' and ewes' milk); **1781** (F. & M. disease in man); **2043** (book, food inspection).

REPRODUCTION AND REPRODUCTIVE DISORDERS

Schmidt, K., Döcke, F. (1959). Besamungsversuche mit tiefgefrorenem Bullensperma (II). **[Inseminations with deep-frozen bull semen. II.]**—Zuchthyg. FortpflStörung. u. Besamung. **3,** 257-264. **1991**

Using 5 bulls 1,074 control inseminations were contrasted with 1,313 using deep-frozen semen. In both a 1 :20 dilution with egg yolk–citrate was employed. Glycerin was used at 7·5%; little further detail is supplied on the freezing process. The frozen material required 2·42 inseminations per pregnancy, the control only 1·8. Results did not vary from bull to bull. The authors attribute noticeably better results obtained at second rather than at first insemination to the circumstance that a large proportion of subjects were inseminated too soon after calving. The incidence of non-returns plotted against that of actual established pregnancies corresponded only moderately closely.—F. L. M. Dawson.

Adler, H. C. (1960). **The comparative efficiency of the intracervical and intrauterine insemination of cattle with streptomycin-treated and non-treated semen.**—Acta vet. scand. **1,** 105-113. [In English. Summaries in German and Danish.] **1992**

In 7,000 first inseminations from 5 bulls, the conception rate from insemination into the uterus was 71·8% with the addition of streptomycin and 70·9% without (a non-significant difference), and into the cervix 72·6% with streptomycin and 67·8% without.—M.G.G.

Dunlop, A. A. (1959). **An insemination crate for sheep.**—Aust. vet. J. **35,** 256-258. **1993**

One operator, alone or preferably with some assistance, can carry out artificial insemination using this device. No handling of the ewe is necessary. The crate can rotate about a vertical axis and incorporates a headbail and a roller which elevates the hindquarters of the ewe. Both headbail and roller are operated by levers.—A. Culey.

Paufler, S. (1950). Untersuchungen über die Wirksamkeit antibiotischer Zusätze auf die Bakterien der Samenflora im verdünnten Bullensperma. **[Effect of antibiotics on bacterial flora of diluted bull semen.]**—Dtsch. tierärztl. Wschr. **67,** 63-66 & 99-102. [Summary in English.] **1994**

Four or five strains each of different species of bacteria were exposed to antibiotics at 37°C. for one hour in diluted bull semen. *Corynebacterium pyogenes* was strongly inhibited and *Staphylococcus aureus* was killed by penicillin at a concentration of 2,000 i.u./ml. *Brucella abortus* and *Vibrio fetus* were killed by streptomycin at 2,000 i.u./ml. *Streptococcus pyogenes* was not greatly inhibited by these antibiotics. *Pseudomonas pyocyanea* was not killed consistently by a combination of 250 i.u. penicillin, 250 i.u. streptomycin and 50μg. polymyxin per ml. It is pointed out that these concentrations of antibiotics are toxic for spermatozoa.—M.G.G.

Corrias, A., Pautasso, N. (1959). Contenuto microbico del materiale seminale bovino tenuto a −79°C.; sua influenza sulla fertilità. **[Bacterial content of bull semen kept at −79°C. and its bearing on fertility.]**—Zootec. e Vet. **14,** 279-281. **1995**

Culture of semen samples indicated that deep freezing had no effect on the bacterial content; the two commonest genera were *Pseudomonas* and *Proteus,* followed by *Escherichia coli.* No figures are given, but the authors claim that in 3–4% of inseminated cows a *Pseudomonas* catarrhal endometritis developed within 15–20 days, causing return to service at very variable intervals. This was

never seen when fresh semen treated with penicillin and streptomycin was used. [But there is general agreement that polymyxin is the only antibiotic likely to be effective against *Pseudomonas* (*e.g.* Stellmacher, *V.B.* **25,** 314) —Abstractor.]—F. L. M. Dawson.

Karg, H., Leidl, W. (1959). Untersuchungen über die Zusammensetzung von Schweinesperma. **[Composition of boar semen.]**—Zuchthyg. FortpflStörung. u. Besamung **3,** 232-242. **1996**

The semen composition was investigated in 6 boars. Mean ejaculate volume was 160 ml. plus 42 ml. gelatinous substance. For individuals there was a reciprocal correlation between density and total numbers (as described by Glover & Mann, 1954). Mean density was 220,000 per cu. mm. Mean percentages for forward-moving spermatozoa varied as between boars from 64–79%. Hexose values showed wide individual variation, with extremes 32–75 and 70–144 mg.%. The 3 older boars (over 8 months) showed the higher ergothioneine values, over 25 mg.%. The mean value for plasma ascorbic acid showed little individual variation at 3·4–4·3 mg.%. Total nitrogen values were also determined. Exhaustion tests on 4 boars showed a progressive fall, at 6 collections daily, in ascorbic acid concentration, ascribed to its use in mobilization of corticotrophin and gonadotrophin. Even a highly fertile boar can give occasional "doubtful" ejaculates; hence the possibility of poor breeding results in A.I. when only one collection is taken.—F. L. M. Dawson.

Kamar, G. A. R., Badreldin, A. L. (1959). **Sperm morphology and viability.**—Acta anat. **39,** 81-83. [In English. Summaries in French and German.] **1997**

Abnormal spermatozoa in semen from cocks of the Egyptian Fayomi breed were described.—R.M.

Wales, R. G., White, I. G. (1959). **The susceptibility of spermatozoa to temperature shock.**—J. Endocrin. **19,** 211-220. [Authors' summary modified.] **1998**

The susceptibility of spermatozoa from bull, ram, rabbit, dog, man and cock to cold shock and high temperatures has been assessed by motility and differential staining.

Ram and bull spermatozoa were increasingly affected by cold shock at temperatures below 15°C. but other spermatozoa were little affected. Epididymal ram spermatozoa, particularly those with an attached kinaplasmic droplet, were more resistant than ejaculated ones; the addition of seminal plasma had little effect.

Second ejaculates from bulls were slightly more resistant than first ejaculates. Washing bull or cock spermatozoa free of seminal plasma did not influence their susceptibility to cold shock.

Five min. at 50°C. severely depressed the motility of all spermatozoa except those of the cock which were completely immobilized at 55°C. Most spermatozoa took up stain more readily when mixed with it at high temperatures than when brought back to room temperature and then mixed; this is due to an increase in the toxicity of the stain at high temperatures.

Blackburn, P. S., Castle, M. E. (1959). **The use of the oestroscope and its value in detecting oestrus in dairy cattle.**—Brit. vet. J. **115,** 399-407. [Authors' summary modified.] **1999**

Details are given of the equipment required for taking samples of vaginal mucus and determining its "flow elasticity" by the method of Blair *et al.* [*V.B.* **12,** p. 359 & p. 508].

750 samples from 19 autumn-calving Ayrshire cows and heifers were examined.

Omitting the results for four abnormal cows, visible signs of oestrus occurred either on the day of the peak value of the "flow elasticity" or within one day before it or one day after it for 94% of all the observations.

Klinge, A. (1959). Zum zyklischen Verhalten vornehmlich der Höhe des Endometriums beim Rind. **[Cyclical variations, particularly in thickness, in the endometrium of the cow.]** —Zbl. VetMed. **6,** 742-780. [Summaries in English, French and Spanish.] **2000**

97 uteri from cows that had borne from two to four calves were sectioned, including 9 in the oestrual phase, 23 and 20 in two metoestrual phases and 26 in full dioestrus. Two pro-oestrual phases, 18–19 and 21–22 days, were recognized, represented by 8 and 11 uteri. Stages of cycle were determined purely by ovarian inspection based on Küpfer's criteria. To avoid artefacts Susa's fixative was more satisfactory than 5% formol. Height of mucosa was measured with a Leitz ocular micrometer. Despite earlier reports that the mucosa reached its maximum height at oestrus, K. found the maximum height at the 12th day. There were individual variations, however; the minimal height for one

cow might exceed the maximal for another. This may account for the reported discrepancies. Both diffuse and lacunar types of oedema were recognizable, best developed at the time of heat. Rod cells in the surface epithelium and lymphoid-type cells (not necessarily lymphocytes) especially in the glandular epithelium were usually recognizable but were absent over the 18th–19th days of the cycle.
—F. L. M. Dawson.

Preuss, F., Helm, F.-C. (1959). Hyperplasie der Uterindrüsen des Rindes. **[Hyperplasia of uterine glands in cattle.]**—Berl. Münch. tierärztl. Wschr. **72,** 345-348. [Summary in English.] **2001**

The authors agreed with Klinge [see preceding abst.] that hyperplasia was greatest at the time when the corpora lutea were fully developed, and not at the time of oestrus as stated by Vollmerhaus [*V.B.* **27,** 2242 & **29,** 2688].—R.M.

Leidl, W., Schaftner, N. (1959). Über den Einfluss von Samenblasensekret auf die Uterusmotilität in vitro. **[Action of seminal vesicle fluid on contractions of isolated bovine uterus.]**—Zuchthyg. FortpflStörung. u. Besamung **3,** 265-272. [Summary in English.] **2002**

Bovine and porcine uterine muscle strips from freshly slaughtered animals, maintained at 37°C. in Tyrode solution, were subjected to a concentration of 1 in 25 (2 ml. in 50 ml.) of seminal vesicle fluid from bulls and castrate oxen, also to whole semen. Whole semen gave variable results : in some trials tone was raised and in others lowered; vesicle fluid from castrates was negative; but bull vesicle fluid rather consistently (17 out of 27 trials) lowered the tone of both cow and pig uterus for several minutes, a similar effect to that obtained with adrenaline. However in certain cases the vesicle fluid produced a strengthening of individual uterine contractions. The uterus was more responsive during oestrus than at other times.—F. L. M. Dawson.

Winqvist, G. (1959). **Bone marrow changes in cows in connection with normal parturition, parturient paresis, and retained foetal membranes.**—Acta vet. scand. **1,** 27-40. [In English. Summaries in German and Swedish.] **2003**

At normal parturition in cows, an increase in all neutrophile stages was observed in the bone marrow especially in the most immature cells. There was also a statistically significant decrease in the percentage of eosinophiles and erythroid cells. In cases of parturient paresis, the bone marrow picture did not differ appreciably from that at normal parturition except that the percentage of neutrophile myelocytes was higher. In cases of retained foetal membranes and in 2 normal twin births, a significant maturation inhibition in the neutrophile series with a very low percentage of mature neutrophiles was observed. The tendency was present even before parturition. In all cases in which there was a marked increase in the percentage of immature neutrophiles degenerative changes were seen in these cells.
—A. Ackroyd.

Buruiana, L. M., Ciurea, V., Pascal, V. (1959). Action de la para-oxy-propiophénone (P.O.P.) sur le cycle sexual de la truie. **[Action of para-oxy-propiophenone on the oestrous cycle in sows.]**—Rec. Méd. vét. **135,** 709-720. [Summaries in English and Spanish.] **2004**

This drug, also known as 4-hydroxy-propiophenone, is described as a synthetic pituitary inhibitor. Administered parenterally, it inhibited oestrus in sows and decreased epithelial proliferation causing involution of the vaginal epithelium. In mice it increased the lipids in the adrenal cortex and inhibited the thyroid. Its effect on the oestrous cycle in sows was explained by the increased secretion of adrenal corticosteroids which caused pseudopregnancy with decrease or disappearance of libido.—T.E.G.R.

I. Short, R. V. (1959). **Progesterone in blood. IV. Progesterone in the blood of mares.**—J. Endocrin. **19,** 207-210. **2005**

II. Short, R. V., Moore, N. W. (1959). **Progesterone in blood. V. Progesterone and 20α-hydroxypregn-4-en-3-one in the placenta and blood of ewes.**—Ibid. 288-293. [Authors' summaries modified.] **2006**

I. Progesterone was measured in the blood of pregnant and non-pregnant mares, and in umbilical cord blood collected during foaling. Progesterone was readily detectable in the blood provided that there was a fully developed corpus luteum present in the ovaries. During the second half of gestation, when the ovaries have become fibrotic, progesterone was no longer detectable in the peripheral blood, even though it was in high concentration in umbilical cord blood.

During the second half of gestation placental progesterone probably exerts a local action on the uterus, without even entering

the maternal circulation. This local action is made possible because of the diffuse, epitheliochorial nature of the mare's placenta.

II. Progesterone has been identified in the placenta of intact and ovariectomized ewes in concentrations of 4–9 μg./kg. tissue. In addition a closely related metabolite, 20α-hydroxypregn-4-en-3-one, has been found in concentrations of 9–12 μg./kg. tissue. Concentrations of both steroids were highest in the placenta from ovariectomized animals, suggesting that the placenta might be able to compensate for removal of the ovaries.

It is concluded that the sheep placenta can produce small amounts of progesterone, and that some homeostatic mechanism exists for the maintenance of a relatively constant blood progesterone level throughout pregnancy. It is still not possible to assess the relative importance of the adrenals and the placenta as extra-ovarian sources of progesterone in the ewe.

Grandchamp, G. (1960). Les indications et le mode d'emploi de la progestérone chez la vache. **[Use of progesterone in cows.]**—Schweiz. Arch. Tierheilk. **102,** 18-27. [In French. Summaries in English, German and Italian.] **2007**

G. treated ovarian cysts, vaginal prolapse and endometritis in 150 cows by s/c or i/m injection of progesterone, producing normal oestrus in 125, of which 99 subsequently became pregnant. Cows with cysts in one ovary were given 150–200 mg., those with cysts in both 200–350 mg. When necessary, treatment was repeated within 10–15 days.—E.G.

Moore, N. W., Rowson, L. E. A. (1959). **Maintenance of pregnancy in ovariectomized ewes by means of progesterone.**—Nature, Lond. **184,** Suppl. No.18 p.1410. **2008**

24 ewes were spayed at the time they received egg transplants, 3–4 days after oestrus, 12 then receiving 10 or 20 mg. progesterone daily for 60 days, and the others the same together with 5μg. oestradiol benzoate. The progesterone group produced 17 lambs from 10 of the ewes, the progesterone/oestradiol group 8 lambs from 6 and the controls 19 from 10. 10 mg. daily was an adequate dosage of progesterone. The authors assumed that ovariectomy is always possible in the 50-day pregnant ewe without abortion resulting. [But Casida & Warwick (see *V.B.* **15,** 1663) found a wide individual variation, the corpus luteum being indispensable in some ewes up to the 100th day.]—F. L. M. Dawson.

Ralph, C. L., Fraps, R. M. (1960). **Induction of ovulation in the hen by injection of progesterone into the brain.**—Endocrinology **66,** 269-272. [Authors' abst. modified.] **2009**

Progesterone in propylene glycol regularly induced premature ovulation in the hen when injected into certain regions of the hypothalamus or the caudal neostriatum but not in other parts of the forebrain. The effective quantity was not more than 5 μg. Progesterone did not induce ovulation when injected into the pituitary. It is thus indicated that the steroid acts upon certain regions of the brain to cause release of ovulation-inducing hormone.

Santolucito, J. A., Clegg, M. T., Cole, H. H. (1960). **Pituitary gonadotrophins in the ewe at different stages of the estrous cycle.**—Endocrinology **66,** 273-279. [Authors' abst. modified.] **2010**

The content of FSH, LH, and luteotrophic hormone (LTH) in ewe pituitaries has been determined 4 hours, 35 hours, 10 days, and 15 days after first acceptance of the ram. Pituitary FSH and LH decreased between 4 hours and 35 hours after first acceptance, and returned to pro-oestrus levels by the 15th day of the cycle. Pituitary LTH content did not vary. It is suggested that FSH plays an active role in the induction of ovulation and that the assumption of a specific release of LH may not be valid for ewes.

Velle, W. (1959). Undersøkelser over naturlig forekommende østrogener hos drøvtyggere og gris. **[Oestrogens in ruminants and pigs.]**—pp. 162. Oslo: Institutt for Seksualfysiologi og Seksualpatologi. [Abst. from English summary.] **2011**

Quantitative and qualitative analyses of oestrogens were made in the following. (1) Meconium from cattle, sheep, goats, and pigs, and urine of a new-born calf; (2) placenta and urine from pregnant cows, ewes and sows; (3) follicular fluid and follicular cysts from non-pregnant cows, and urine from non-pregnant cows and sows; (4) testis and urine from bulls and boars. Some of the results have been reported elsewhere [*V.B.* **28,** 1265, 2675, 3443; **29,** 576, 1248].

Kristoffersen, J., Velle, W. (1960). **Urinary oestrogens of the dog.**—Nature, Lond. **185,** 253-254. **2012**

The method described by Brown for the determination of oestrogens in human urine was used in studies on dogs. No significant

amounts of oestrone, oestradiol or oestriol were detected in urine from male dogs and from pregnant bitches.—T.E.G.R.

Anon. (1960). **FDA investigating use of stilbestrol.**—J. Amer. vet. med. Ass. **136,** No. 2 p. 24. **2013**

Since May 1959, the Food and Drug Administration of the U.S.A. has refused applications for the use of diethylstilboestrol which might result in residues in human or animal food. Samples of beef, mutton and lamb were free from the drug, but small residues were found in the skin, liver and kidney of poultry. Manufacturers of diethylstilboestrol have agreed to suspend sales, and the poultry and retail food industries have complied with a request to cease supplying treated birds.—M.G.G.

Nicol, T., Ware, C. C. (1960). **Minimum dose of diethylstilboestrol required to stimulate the phagocytic activity of the reticulo-endothelial system.**—Nature, Lond. **185,** 42-43. **2014**

Mice were injected s/c with varying doses of diethylstilboestrol in arachis oil daily for 6 days. Controls were injected with arachis oil alone. Stimulation of phagocytic activity occurred with 0·1 mg., beyond which it did not increase in proportion to the dose. This dose is about 100 times greater than that inducing oestrus. Small doses increasing to 0·1 mg. were accompanied by a gain in body weight; higher doses caused a decrease.
—T.E.G.R.

Shalash, M. R., Salama, A. A. (1960). Störungen im Bereich des Geschlechtsapparates bei Büffelkühen. **[Abnormalities of the genital system in buffalo cows.]**—Dtsch. tierärztl. Wschr. **67,** 44-45. [Summary in English.] **2015**

Abnormalities and lesions present in 477 of 2,109 female genital organs from slaughtered buffaloes are listed.—E.G.

Bosman, S. W. (1959). Sekere faktore wat die aanteelvermoë van Merino-ooie beïnvloed. **[Factors affecting fertility in Merino ewes.]**—S. Afr. J. agric. Sci. **2,** 165-182. [In Afrikaans. Summaries in English and French.] **2016**

The number of lambs reared till weaning, as a percentage of ewes mated, is used to express reproductive efficiency. Over 6 years, 29% more lambs were reared with autumn than with spring mating. The improvement was especially marked regarding mating of maiden gimmers, and a ewe's performance steadily increased up to 8 years old. Autumn lambing was concentrated into a period of only 4 weeks. Good, as contrasted with poor, karoo pasture produced lambing percentages respectively of 86 and 53%.—F. L. M. Dawson.

Szumowski, P. (1959). L'électrophorèse des protéines du plasma séminal dans la recherche des troubles de la fertilité du mâle. **[Electrophoresis of proteins in seminal plasma and its application to the study of sterility in males.]**—Rec. Méd. vét. **135,** 937-946. [Summaries in English and Spanish.] **2017**

The concentrations of albumin and globulins were determined in the seminal plasma of bulls of different breeds by electrophoresis on paper and in agar. An albumin content of over 3% was associated with the presence of abnormal spermatozoa in 68 bulls and low fertility in 17. Six bulls showing an albumin conc. of over 3%, but with normal spermatozoa, had to be culled within 2 years on account of declining fertility. The protein constituents of seminal plasma appeared to be antigenic, but only the albumin was immunologically identical to the albumin in blood serum. Albumin concentrations of 7·7%–15% were found iin the seminal plasma of 3 stallions with a high percentage of abnormal spermatozoa.—M.G.G.

Jaśkowski, L., Romaniuk, J. (1959). Rzadka anomalia plemników związana z zupełną niepłodnością u buhaja. **[Deformity of the head of bull spermatozoa associated with sterility.]**—Med. Wet., Warszawa **15,** 760-761. [In Polish. Summaries in English and Russian.] **2018**

Semen of a 3-year-old pedigree bull, which served 23 cows without a single conception, revealed a deeply stained area on the anterior pole of 9·6% of the spermatozoa. Otherwise the semen was normal and there was no evidence of a concurrent disease in either the bull or the cows.—M. Gitter.

Urbányi, L. (1959). A vérvizsgálatok értéke a szarvasmarha alimentáris eredetú, időleges meddőségének felismerésében. **[Blood tests in cattle in the diagnosis of temporary sterility of nutritional origin.]**—Mag. állator. Lapja **14,** 285-288. [In Hungarian. Summaries in English and Russian.] **2019**

Inorganic phosphorus was estimated in blood samples from 484 cattle. (302 infertile and 153 pregnant cows of one herd, and 29 heifers and infertile cows from several other herds). Wide variation amongst the values

obtained, was assumed to be partly due to individual characteristics and partly to different management as it could not be correlated with age, milk production, presence or absence of infertility or its duration, and the nature of the vaginal discharge during oestrus.

It was concluded that analysis of the phosphorus content of the blood of infertile animals, apart from cases of extreme phosphorus depletion, is of little diagnostic value.

—A. Sebesteny.

Alfonso, C. G., Perez y Perez, F. (1959). Infecundidad inmunológica de carácter espermático en las hembras domésticas. **[Sterility due to sperm agglutinins in female domestic animals.]**—An. Inst. Invest. vet., Madrid **9**, 285-302. **2020**

Intramuscular injection of semen into rabbits raised the agglutinin concentration of serum and when this exceeded 1 in 200, muco-agglutinins in the vagina were also present. These produced infertility in concentrations over 1 in 100. Similar muco-agglutinins could also be produced by daily insemination for 40 days and eventually serum agglutinins could also result from this stimulus. The authors claim to have demonstrated similar blood and mucus reactions in infertile mares and consider 10% of infertility in this species to be so caused. 10–15 ml. of semen injected i/m for 10–15 days provokes a serum antibody level of 1 :100 to 1 :200; the antibodies persist for 6–8 months. Positive sero-agglutination reactions have been detected in only 0·5% of cattle, and only at low levels, the short heat period reducing opportunity for the phenomenon to develop. However, infertility in nymphomania cases may be prolonged by this means. Temporary infertility with sperm agglutinin titres of over 1 :100 in serum has been demonstrated in cows inseminated by vulsellum forceps technique — the forceps lesions presumably allowing increased seminal absorption.—F. L. M. Dawson.

Tanner, K. (1960). Ein überraschendes Resultat bei einem unorthodoxen Versuch mit dem antireticulo - endothelial - cytotoxischen Faktor im Kampf gegen die Sterilität der Rinder. **[Treatment of sterile cattle with antireticular cytotoxic serum.]**—Tierärztl. Umsch. **15**, 25-27. **2021**

T. used a freeze-dried antireticular cytotoxic serum prepared in calves against rabbit material as antigen, and standardized to contain 120 "cytotoxic units" per ml.

Of 51 cows with ovarian dysfunction which had not yielded to other forms of treatment, 41 held to the first and 2 to the second service after three 2-ml. injections of this serum subcutaneously on alternate days. Purulent endometritis cases did not respond but response by cystic and catarrhal cases was generally good. A single 4-ml. dose appeared to restore serving ability within 24 hours to two impotent bulls.—F. L. M. Dawson.

Sorensen, A. M., Hansel, W., Hough, W. H., Armstrong, D. T., McEntee, K., Bratton, R. W. (1959). **Causes and prevention of reproductive failures in dairy cattle. I. Influence of underfeeding and overfeeding on growth and development of Holstein heifers.** —Bull. Cornell agric. Exp. Sta. No. 936 pp. 51. **2022**

Details are given of the effects of 3 levels of feed on growth, feed utilization, attainment of first oestrus, growth and development of udder and genital tract, and various endocrine organs in heifers.—E.V.L.

See also absts. **1679** (tuberculin testing and abortion); **1705-1724** (brucellosis); **1733-1734** (vibriosis); **1764-1765** (trichomoniasis); **1769** (abortion in ewes due to toxoplasmosis); **2031** (report, Australia); **2044** (transactions of conference on gestation).

ZOOTECHNY

Zhamin, V. A. (1959). **[Chinese agriculture.]** —pp. 286. Moscow: Gosud. izdatel'stvo sel'skokhoz. literatury 6r.45k. [In Russian.] **2023**

This book contains a 26-page chapter on animal husbandry. It is stated that rinderpest was completely eradicated in 1952 and that there had been few cases of foot and mouth disease since 1953. In 1957 the livestock population was estimated as 66 million cattle, 7·5 million horses, 11 million donkeys, 1·8 million mules, 96·5 million sheep and goats, 145 million pigs. The principal breeds of stock are described.—R.M.

Tuffery, A. A. (1959). **The health of laboratory mice. A comparison of general health in two breeding units where different systems are employed.**—J. Hyg., Camb. **57**, 386-402. [Author's summary modified.] **2024**

Two units, within a mouse-breeding colony, with different breeding systems have been compared from the point of view of general healthiness of the breeding stock. In

one unit the monogamous-pair system, involving post-partum oestrus mating, was employed and in the other the harem system, with isolation of the pregnant females for each parturition until after the post-partum oestrus.

Apart from a small outbreak of Tyzzer's disease (in the harem-bred unit) and sporadic cases in both units spread over the whole period of the survey (some 3–4 years) the general health of the two units was good.

The health record of the monogamous-pair bred unit was consistently higher than that of the harem-bred unit. There were more cases of Tyzzer's disease in the harem-bred mice and more evidence generally of ill health in this unit. Infertility was three times greater with the harem-bred mice as compared with those in the monogamous-pair unit.

Yeates, N. T. M. (1959). **Slide rule for judging and grading beef carcases.**—J. Aust. Inst. agric. Sci. **25,** 301-304. **2025**

This is a preliminary description of a slide rule which measures fleshing index, and which corrects for over-fatness.—A. CULEY.

Brumby, P. J. (1959). **The grazing behaviour of dairy cattle in relation to milk production, live weight, and pasture intake.**—N.Z.J. agric. Res. **2,** 797-807. **2026**

At Ruakura 25 cows, 10 Jersey, 10 Friesian and 5 non-lactating miscellaneous cows were observed throughout four 24-hour periods within a fortnight in early spring and again in late spring, in summer and in autumn. Data were collected on age of animals, live weight, grazing times, rumination times, herbage intake as estimated by the chromium-marker nitrogen digestibility technique, and on yield of fat-corrected milk (f.c.m.).

A positive relationship was found between: grazing time and herbage intake; grazing time and f.c.m. production; rumination time and herbage intake; and rumination time and f.c.m. production. The grazing time per unit of intake was greater in the Jersey than in the Friesian. The Friesian however, showed somewhat greater rumination time indicating a greater fibre intake than in the Jersey and thus presumably less selection in grazing. The food required per lb. of f.c.m. was greater in the Friesian than in the Jersey. —A. BROWNLEE.

See also abst. **2045** (textbook for farriers and veterinary students).

TECHNIQUE AND APPARATUS

Rice, E. W. (1960). **Spectrophotometric determination of serum copper with oxalyldihydrazide.**—J. Lab. clin. Med. **55,** 325-328. [Author's summary modified.] **2027**

A rapid, quantitative, and precise spectrophotometric method for the determination of serum total copper with the use of oxalyldihydrazide as a sensitive colour reagent is presented. The method is applicable to tissue and urine analysis by use of a wet acid-digestion process.

Hunter, G. (1960). **Micro method for the determination of calcium and magnesium in general biological material.**—Analyst **85,** 12-20. **2028**

The method previously described [*V.B.* **29,** 1969] was suitable for blood serum but not for urine, muscle and most organs because of interference from the presence of excessive amounts of phosphate. This disadvantage was overcome by a phosphate precipitation procedure.—R.M.

Nikitin, E. E. (1960). **[Spray drying of biological products.]**—Vestnik Sel'skokhoz. Nauki **5,** No. 1 pp. 54-60. [In Russian. Summaries in English, French and German.] **2029**

N. described an apparatus able to dry under sterile conditions 5 litres of immune serum an hour. The effect of drying on potency of immune sera against swine erysipelas, swine fever, swine paratyphoid, Aujeszky's disease, anthrax and bivalent sera against calf paratyphoid and colibacillosis was investigated. Dried sera could be stored for at least 4 years.—R.M.

See also absts. **1786** (detection of Negri bodies); **1848** (new serological techniques in virus research); **2041** (book, histology).

REPORTS

Canada, Ontario. (1959). **Report for the year 1958 of the Ontario Veterinary College, Guelph, Ontario.** pp. 77. Guelph, Ontario: Department of Agriculture. **2030**

Research in progress included the following (see pages 66–75): biology of *Lymnaea humilis* and *L. palustris;* copper deficiency as related to excess molydenum in cattle; pheno-

thiazine metabolism in birds; blood groups in pigs; properties and typing of *Past. septica;* virus encephalomyelitis in pigs and idiopathic encephalitis in piglets; mulberry heart disease of pigs; infectious hepatitis in turkeys; demodectic mange in cattle; chemical estimation of urinary oestrogens in animals; a haemorrhagic disease of dogs resembling Christmas disease.
—R. V. L. Walker.

Australia. Queensland. (1959). **Annual report of the Department of Agriculture and Stock for the year 1958-59.** pp. 106. Brisbane: S. G. Reid, Govt. Printer. [Items of veterinary interest. pp. 54-64.] **2031**

Streptococcal Septicaemia in chickens was associated with stress (long transport, debeaking, chilling). Bovine Mastitis due to *Streptococcus agalactiae* is less common since the advent of antibiotics, but other bacteria have been isolated from clinical cases (*Staph. aureus* 388, *Str. agalactiae* 91, *Str. dysgalactiae* 4, *Str. uberis* 28, *Streptococcus* group G 2, *Corynebacterium pyogenes* 14, *Pseudomonas* sp. 13, *Klebsiella* spp. 25, *Escherichia coli* 7). Two cases were caused by *Klebsiella pneumoniae* and one cow died. Vibriosis was detected in 9 beef herds, mostly associated with infertility, it is widespread in dairy herds but antibiotic therapy is reasonably effective. Artificial insemination has reduced losses. Compulsory tuberculin testing of dairy cattle was extended. About 900,000 cattle are under regular test. The incidence varied from 0·02 to 1·63%. In beef herds the incidence was higher (up to 11·4%), but is being reduced. In North Queensland there was a high incidence of reactors with no visible lesions. *Pasteurella* spp. were isolated from Pneumonia in pigs. *Pseudomonas pseudomallei* (*Pfeifferella whitmori*) has been isolated from sheep, goats, pigs, cattle and horses. A complement-fixation test is satisfactory for sheep and pigs, but a haemagglutination test was better for cattle. The incidence of Swine Erysipelas was low but paralysis of infected young pigs was more frequent. Brucellosis. 37,000 cattle were vaccinated with Strain 19. Vaccination of adults is permitted but not encouraged. *Brucella ovis* was isolated from a foetus and rams in a flock where the incidence of abortion was 40%. The organism is responsible for abortions in ewes of the British breeds, but not in Merino ewes. A soluble antigen highly active and free from anticomplementary activity was prepared from *Br. ovis* by rupture of the organisms with a Mickle disintegrator and high-speed centrifugation. Despite failure to recover *Clostridium botulinum* from most cases of "Coast Disease" in cattle, toxoid inoculation appeared to provide control. *Candida tropicalis* was isolated from the placenta of an aborted calf. A case of bovine Actinobacillosis had symptoms like those of bovine malignant catarrh. An actinobacillus was isolated from Epididymitis in a ram and reproduced the disease when inoculated into other rams. Leptospirosis. Abortion storms were less severe and there was a lower incidence in calves. Three quarantines were imposed in outbreaks of Bovine Contagious Pleuropneumonia. Drought interfered with control measures. Trichomoniasis was detected in two beef herds, no infected dairy herds are known. Tick Fever was unusually prevalent, not only in marginal areas following the spread of *Boophilus microplus,* but also in areas where the tick is normally present. Most cases were ascribed to *Babesia argentina.* Cattle inoculation with infected blood remained infective for a year; monthly inoculation with infected blood prolonged the usefulness of a bleeder as a donor but its blood was not regularly infective; a 5 ml. dose of blood did not always infect or immunize, but a 100 ml. dose did so regularly; calves from immunized cows showed marked resistance for some weeks after birth; attempts to infect laboratory bred ticks with the vaccine strain of *B. argentina* were unsuccessful, but such ticks were infected successfully with a field strain. Anaplasmosis was treated successfully with oxytetracycline.

Fowl Cholera was recorded in North Queensland. A severe outbreak of Pullorum Disease occurred in a hatchery although the incidence had been reduced by blood testing from 5% to 0·2% in 12 years. Faulty incubator hygiene was responsible for the breakdown.

A fatal debilitating disease of horses in Central Queensland closely resembles equine infectious anaemia.

Winter Dysentery appeared in cattle at the show in Brisbane and then spread throughout the coastal areas. The chief symptoms were scouring and loss of production.

Ephemeral Fever occurred in coastal areas in the central north.

Echidnophaga gallinacea was found beyond its previous location.

The addition of DDT to diazinon and "Delnav", did not prolong their residual toxicity in the fleece against Fly Strike. The

organic phosphorus compounds persisted for 7 to 8 weeks, diazinon at the base of the staple, "Delnav" higher up. DDT disappeared from the base of the staple in 3 weeks, more rapidly than wool growth, but persisted in the upper part of the staple for 14 weeks. "Korlan" (crude ronnel) persisted at the base of the staple for 18 weeks when "jetted" at 0·25%. "Rognor", similarly applied had disappeared in 3 weeks. *Lucilia cuprina* which were resistant to dieldrin were also resistant to aldrin and BHC but not to DDT or diazinon.

There were wide extensions of the areas affected with *Boophilus microplus*. There is evidence of declining susceptibility to DDT. Overwintering of ticks appears to be important in Central Queensland. In the Charters Towers region there were two peaks of abundance of larval ticks, in September–October and at the end of the wet season (early autumn).

Psorergates ovis declined in summer and did not increase again until late autumn, even in housed sheep. Patch tests with "Kelthane" 0·1% gave promising results.

Sparganosis (*Spirometra erinacei*) was found in pigs. Heavy infestations with *Haemonchus contortus* were recorded in sheep, and *Dictyocaulus viviparus* in calves.

When grazing *Paspalum dilatatum* ewes maintain moderate copper reserves but cows have very low reserves. Pregnancy did not markedly influence the copper status of the dams, and the offspring had adequate reserves at birth. Lambs maintained liver copper levels (200 p.p.m. dry matter) but calves showed rapid depletion from 330 p.p.m. to 30 p.p.m. in two months and 15 p.p.m. in four months. Pen trials showed that in cattle fed on paspalum the factor which disturbed copper metabolism was not molybdenum but was related to the protein content.

In an area characterized by an acute Aphosphorosis in cattle it was found that the diet selected in late pregnancy was moderately low in phosphorus, that stress of pregnancy and lactation depleted phosphate reserves and that post-parturient grazing of sown crops provides a diet with a wide calcium : phosphorus ratio.

Infectious Diarrhoea occurred in bulls brought to the laboratory for immunization against tick fever. Muscular dystrophy in sheep appears to have become prevalent in one flock. Other diseases diagnosed included acute Polyarthritis, sub-acute Leptomeningitis and Encephalomalacia, Exudative Epidermitis, Streptococcal Endocarditis and septicaemia in pigs; Melioidosis in horses; Psittacosis in parrots; Infectious Laryngotracheitis in poultry.

Acute Selenosis caused deaths of sheep in Central Queensland. Silicosis in horses was prevented by removal to areas where the plant *Morinda reticulata* was not growing.

Among the plants causing poisonings were Noogoora Burr (*Xanthium pungens*) (chiefly in pigs after ingestion of seedlings), *Myoporum deserti* (cattle), *Cheilanthes sieberi* (in cattle after stress of travelling in hot weather), *Portulaca oleracea* and *Tetragonia tetragonoides* (oxalate), *Solanum escuriale* ("humpy back" in sheep), *Asclepias curassavica* (cattle), Iceland Poppy (*Papaver nudicaule*) (HCN poisoning in sheep), *Xanthorrhoea* spp. (cases inland from the usually affected coastal areas), *Gastrolobium grandiflorum, Erythrophloem chlorostachys, Swainsona luteola, Alstonia constricta, Solanum seaforthianum, Duboisia myoporoides, Cestrum parqui, Lantana camara, Pteridium aquilinum, Trema aspera, Terminalia oblongata, Datura* spp., *Macrozamia* spp., *Eremophila maculata, Crotolaria dissitiflora, Amaranthus macrocarpus, Brachychiton populneum,* wilted sorghum (pigs).

Mortality in new-born calves was widespread in some areas; vitamin K appeared to be useful in treatment.—H. McL. Gordon.

Australia. South Australia. (1959). **Twentieth Annual Report of the Council of the Institute of Medical and Veterinary Science, July 1957—June 1958.** pp. 91. Adelaide: W. L. Hawes, Govt. Printer. [Items of veterinary interest pp. 62-81.] **2032**

Ovine Brucellosis. Observations in an "epidemiology" flock over three years showed a very slow spread of the disease. It did not seem to affect lambing rates. Many lambs born to infected ewes gave a positive or suspicious complement-fixation reaction, but all became negative at 3 to 4 months old. Eradication was achieved by testing rams before and after mating and slaughtering all reactors.

Several strains of pleuropneumonia-like organisms have been grown in bulk liquid cultures and some haemagglutination experiments were begun.

Mucosal Disease was diagnosed in calves in the Mt. Gambier district. In a survey, by challenging calves by inoculation of blood from known cases, many proved immune and it was concluded that the disease was endemic.

Studies were made of the cytopathic effect of INFECTIOUS LARYNGOTRACHEITIS virus. Vaccines were prepared from a strain of low virulence and work began on the production of a vaccine from tissue culture. Much detail is included in the section on this disease.

Tissue cultures of embryonic lung from the pig have been established for studies on VIRUS PNEUMONIA.

Cattle, nine months old, brought from the arid areas in the Northern Territory to the higher rainfall areas had an acquired immunity sufficient to protect them against helminthosis. A further survey of locally bred calves 4 to 8 weeks old did not reveal helminth infestations. DICTYOCAULOSIS in cattle is rare or mild. Hexachlorethane was effective against *Fasciola hepatica* in cattle but was fatally toxic in two of 97 lactating cows, and reduced milk production severely. Epidemiological studies on helminths of sheep provided evidence that malnutrition is not a factor in worm disease of young sheep under South Australian conditions. Phenothiazine in doses of 1100 to 1700 mg./kg. body weight did not give a satisfactory response. In late lambs (born in June) monthly treatment with phenothiazine resulted in an increase of 8 lb. per head by the following June. This is ascribed to control of *H. contortus*. Trials of phenothiazine at 15 g. and 30 g. at weaning time "cast doubts on the efficacy of the drug . . . in expelling worms or in reducing contamination of pastures". A pre-lambing dose of phenothiazine of 700 mg./kg. to ewes reduced egg counts but it was considered that the reduction was unlikely to affect the acquisition of infection by lambs. Toxicity trials with the organic phosphorus compound "Neguvon" (Dipterex) showed that in sheep fed in pens an oral dose of 9·5 to 12·5 g./100 lb. was fatal, 4·5 to 10·0 g. caused clinical symptoms but 4·0 to 8·5 g. had no ill effects. Moderate symptoms were produced by a s/c dose of 2·5 g./100 lb. A heavy helminth infestation was recorded in a 3-year-old ewe which was in poor condition and had diarrhoea (90,000 adult and 50,000 immature *Ostertagia* spp., and 40,000 adult and 10,000 immature *Trichostrongylus* spp.).

The cobalt content of the liver of sheep reverts to pre-treatment levels by about 30 days after drenching with cobalt. Livers of sheep which have a cobalt "bullet" in the rumen have high values, but little is known of the persistence of the bullets. The use of the cathode ray polarograph for the estimation of cobalt is described.

HYPOMAGNESAEMIA was reported in sheep with blood levels of 0·98 to 1·6 mg./100 ml.

In cattle lactation reduced blood phosphorus, but blood phosphorus levels within the range 3·0 to 7·0 mg.% may not be a contributing factor to low fertility.

Cases of special interest included MASTITIS in a ewe caused by a pleuropneumonia-like organism; an outbreak of GLOBIDIOSIS (*Globidium gilruthi*) in sheep associated with oedema of the head, diarrhoea and congestion of the mucosa of the abomasum with numerous whitish nodules in the mucosa of the abomasum and small intestine; MENINGO-ENCEPHALITIS EOSINOPHILICA in pigs fed on whey containing excessive salt (first record in Australia); *Cysticercus tenuicollis* and BLACK DISEASE (INFECTIOUS NECROTIC HEPATITIS); CARBON TETRACHLORIDE POISONING in sheep associated with liver damage probably due to oxalic acid (from *Oxalis* sp.); BOVINE MALIGNANT CATARRH in a locally bred steer which had not had contact with animals from other States; *Salmonella oranienberg* and *S. bredeney* were recorded for the first time in South Australia, from cattle; a local strain of *S. pullorum* produced a better antigen than a commercial antigen.—H. McL. GORDON.

Kenya. (1959). **Veterinary Department Annual Report, 1958.** [MacOwan, K. D. S.] pp. 99. Nairobi: Govt. Printer. Sh. 5. **2033**

FOOT AND MOUTH DISEASE virus type SAT 2 spread from Tanganyika to Kilimanjaro. A concurrent "O" type infection spread south and east to the Tanganyika border. Most districts were infected with either "O" or "A" type virus infection during the year. F. & M. disease vaccine is widely and confidently used by dairy farmers. There have been occasional breakdowns in the immunity but the fall in milk yield has been insignificant in comparison with that in unvaccinated cattle. The first case of LUMPY SKIN DISEASE occurred in December. The course of the disease differed from that described in S. Africa where it appeared to spread chiefly along roads and cattle routes, and where all attempts to confine it by quarantine failed. In Kenya strict quaratine measures were applied and appeared to have helped in confining most of the outbreaks. Of the 79 farms infected in September only 23 remained infected by the end of the year. In general the disease was of low morbidity and mortality. In the main zone of the disease the grazing was heavily infested with the saline water breeding mos-

quitoes *Culex mirificus* and *Aedes natrionius*. The Veterinary Research workers produced evidence that only virus of the "Neethling" type exists in Kenya. The susceptibility of sheep and goats to this type of virus was also established and it was demonstrated that a strain of virus causing a disease resembling sheep pox and originating in fat-tailed sheep from African pastoral districts in Kenya, conferred immunity to the "Neethling" type virus when administered intradermally. Histologically the lesions of lumpy skin disease closely resembled those of pox diseases. Substantial progress has been made by the laboratories towards the production of a vaccine. Only one case of RINDERPEST occurred in the area of European farming. In the African areas the disease was diagnosed in West Suk-Turkana border area. In Masai 11 minor outbreaks were reported (three in game) and two more occurred in the Northern Province. Mass inoculations of young stock were completed in the African area.

For some years BOVINE CONTAGIOUS PLEUROPNEUMONIA has been confined to the Masai lands, where four quarantines remain in force. In Kajiado the situation has much improved. A single dose of the antrycide pro-salt sufficed to protect slaughter cattle against TRYPANOSOMIASIS on the route to the coast. In the Machakos District, a strain of *Trypanosoma vivax* resistant to antrycide and to homidium appeared in farms nearest the "fly-bush". 1,500 cattle were removed from the area and more bush clearing was done. Nine months after the cattle from an area in which trypanosomes were resistant to Antrycide, homidium, Prothidium, and partly to Berenil, had been removed from the area, two strains of *T. vivax* and two strains of *T. congolense* obtained from experimental cattle introduced into the area were subjected to exhaustive laboratory tests. No resistance of any kind could be found. Furthermore, an experimental herd receiving bi-monthly injections of antrycide pro-salt in the area has since been fully protected for five months.

All cattle imported into Kenya must pass the intradermal tuberculin test. Generalized TUBERCULOSIS was diagnosed in two animals in the Machakos District. In meat inspection of 72,947 cattle at Athi River Abattoir only three cases of TB. were found. Cases of JOHNE'S DISEASE appeared in both cattle and sheep in the European areas and in cattle in the Nandi and Kiamba Reserves. The complement-fixation test was used extensively.

In Nyanza Province 2 cases of RABIES in jackals were diagnosed and in a cat in the adjoining Kitale area. A human case was reported in the Southern Province and cases were occurring in the Central Province. 26,071 doses of Flury vaccine were given.

Tick-Borne Diseases. In the Central Province dipping or spraying is applied in all areas. Over 300,000 head are treated, every week, in the African areas. In the Kipsigis and Nandi Reserves 5,000 African farmers cleanse their cattle very well. Cases of tick resistance to acaricides were again reported. An organo-phosphorus parasiticide was added to the scheduled dips to gain control on a few farms.

Routine testing for VIBRIOSIS and TRICHOMONIASIS was carried out at Kabete or Naivasha. The only satisfactory control measure appears to be the use of artificial insemination along with good management. CONTAGIOUS EPIDIDYMITIS-VAGINITIS, nutritional anoestrus, or suboestrus are also mentioned as causing infertility. Strain 19 *Brucella* vaccine is not now so popular with European farmers.

ANTHRAX and BLACKLEG vaccines were used more widely in the African areas. The doses administered were:—Anthrax 280,424 and Blackleg 406,681. In some areas African Councils have passed Bye-laws to make the inoculation of cattle compulsory.

Other Diseases of Bovines mentioned are LEPTOSPIROSIS, "ONDIRI-ITIS" (BOVINE PETECHIAL FEVER), RIFT VALLEY FEVER, PYOGENES INFECTION, THREE-DAY SICKNESS (severe outbreaks) HAEMORRHAGIC SEPTICAEMIA, and MALIGNANT CATARRH. Calf diseases are mainly due to poor husbandry. A number of calves died from F. & M. DISEASE.

Diseases of Sheep and Goats. Helminths were the main cause of losses in sheep. TAENIASIS caused up to 10% mortality among weaners on some farms in Nakuru district. ENZOOTIC PNEUMONIA was rampant among Masai flocks, although on the Purko African District Council Farm where vaccination is practised, losses were negligible. The Kabete vaccine also controlled the disease in the European farming areas. CONTAGIOUS PUSTULAR DERMATITIS occurred in the Nakuru District. Other diseases mentioned are SCAB, MANGE, F. & M. DISEASE, NAIROBI SHEEP DISEASE, BLUETONGUE, PULPY KIDNEY DISEASE, ENTEROTOXAEMIA, GANGRENOUS MASTITIS, FOOT ROT, and PREGNANCY TOXAEMIA. Sheep Nostril-Fly caused mortality in one

area. CAPRINE PLEUROPNEUMONIA was reported in areas where large herds of goats are kept. MANGE and STREPTOTHRICOSIS of goats were also noted in African areas.

Diseases of Pigs. The Colony continued free from AFRICAN SWINE FEVER, except for one outbreak in the Kiambu Reserve, dealt with by slaughter of all animals involved.

Diseases of Horses. There were four outbreaks of ULCERATIVE LYMPHANGITIS. Only sporadic cases of AFRICAN HORSESICKNESS occurred.

Poultry. NEWCASTLE DISEASE is said to have caused a mortality of up to 50% amongst African flocks. Commercial hatcheries and flocks remained free except one large flock where the disease killed 1,200 birds. An experimental inactivated vaccine was used in selected areas with good results. PULLORUM DISEASE occurred on four widely separated farms. FOWL CHOLERA occurred in two areas. TB. was confirmed on one farm.

The Zoological Division of the Department is responsible for tsetse and trypanosomiasis research and reclamation. 9,644 acres were cleared.

Artificial insemination was increasingly used, both in the European farming areas and in the African agricultural areas of high potential. The Central A.I. Station increased supplies of fresh and deep-freeze bull semen from its studs of more than 50 bulls. 101,345 doses of semen were issued in the year.

—J. A. GRIFFITHS.

Denmark. (1960). Årsberetning fra Veterinaerdirektoratet for Året 1958. **[Annual report of the Director of Veterinary Services for 1958.]** [Andersen, S.] pp. 54. Copenhagen: A/S J. H. Schultz. [Summary in French.] **2034**

This report covers the period April 1958 to March 1959 but in the case of bovine brucellosis extends this period to August 1959, when Denmark was declared free from the disease. Ring tests on milk were to be done in each herd every third month. Bovine tuberculosis was eradicated in 1952 and herds were now tuberculin tested every third year. Warble fly larvae were found in only 1·05% of 110,000 herds. The livestock population in July 1958 was 237,000 horses, 3·3 million cattle, 5·3 million pigs, 36,000 sheep and 26·3 million fowls. [For previous report see *V.B.* **29,** 2308.]—R.M.

BOOK REVIEWS

Stableforth, A. W., Galloway, I. A. (1959). **Infectious diseases of animals. Vols. I & II. Diseases due to bacteria.** Vols. I & II. pp. x+810. London: Butterworths Scientific Publications. 160s. **2035**

This important work, designed primarily for post-graduate students, will be of great value to research workers and also to teachers, clinicians and students.

The two volumes under review deal with the bacterial and fungal diseases; further volumes to cover viral and protozoal disease are to follow; the editors of the series are A. W. Stableforth and I. A. Galloway.

The first two volumes consist of 20 chapters, two of which, dealing with brucellosis and streptococcal infections, have been contributed by one of the editors (Stableforth); the remaining 18 chapters are the work of a panel of 21 well known workers. Although most of the authors are from Gt. Britain it is apparent that care has been taken to avoid a parochial approach and it will be found that the numerous references which are appended to each chapter have been gathered from all parts of the world.

The emphasis throughout these two volumes is on the character of the causal organisms, pathogenesis, methods of prevention and treatment, epidemiology, and control or eradication. Illustrations are not particularly numerous but they are of good quality and have been carefully chosen to add something of value to the text.

The chapters vary considerably in length and reflect the relative importance of the various diseases, the longest are those on brucellosis (107 pp.), salmonellosis (76 pp.) and clostridial infections (69 pp.); the shortest deal with coliform infections (10 pp.), actinomycosis and actinobacillosis (15 pp.) and corynebacterial infections (16 pp.).

The contributors in addition to A. W. Stableforth are G. C. Ainsworth, fungal diseases; W. I. B. Beveridge, necrobacillosis, foot rot etc.; T. J. Bosworth, actinomycosis and actinobacillosis; J. C. Broom, leptospirosis; A. Buxton & H. I. Field, salmonellosis; T. M. Doyle, Johne's disease; A. W. Gledhill, swine erysipelas; J. R. Hudson, pasteurellosis; J. R. Lawson, vibriosis; R. Lovell, coliform diseases; F. C. Minett, glanders and melioidosis; A. B. Paterson, J. T. Stamp & J. H. Ritchie, tuberculosis; J. S.

Paterson, listeriosis; R. S. Roberts, clostridial diseases; H. Williams Smith, staphylococcal disease; M. Sterne, anthrax; and A. W. Turner, the pleuropneumonia group of diseases.

This is the most authoritative book on diseases of animals which has been published in Gt. Britain for many years. It is very attractively bound and printed on good quality paper. It is recommended with confidence.

Burnet, F. M. & Stanley, W. M. [Edited by.] (1959). **The viruses. Biochemical, biological and biophysical properties. Vol. I. General virology. Vol. 3. Animal viruses.** pp. xvii + 609 and xvii + 428. New York (& London): Academic Press. 118s. and 86s. **2036**

In these volumes, the first of their type in English, 34 leading virologists from a number of countries have each contributed chapters in their particular field of virology.

Within the disciplines of biochemistry, biophysics and biology, they condense the present knowledge of the physical and chemical characteristics of viruses together with the intra-cellular changes which arise during virus replication. Thus, here, viruses are surveyed in the light of laboratory investigation of their properties rather than as the causal agents of disease. Throughout, those viruses which are treated in most detail have been limited to tobacco mosaic, vaccinia, influenza A and poliomyelitis viruses; these are chosen as prototypes.

In the first volume, (General Virology) with an introductory chapter by Burnet and Stanley on the problems which beset virology, Fraenkel-Conrat discusses the chemical basis of the infectivity of tobacco mosaic virus and other plant viruses. This distinctive contribution is linked with the highly significant discovery that viral nucleic acid is a fundamental organizer of genetic activity subsequent to cell infection.

Another outstanding chapter is provided by Cohen on the structural and chemical architecture of host cells with special reference to the synthesis of polymers. In this he explains something of cell biochemistry for the benefit of the virologist.

Burnet writes of the uses of immunological methods; this approach can provide information on protein differences not obtainable by other means.

The remaining chapters deal with the physical aspects of the relations between the infective particles of viruses and their functional activity, inactivation, their chemistry and their reproduction.

The third volume (Animal Viruses) is introduced by Burnet with a chapter comparing the main groups in virus classification. In a morphological approach, Bang introduces electron microscopy and fluorescent antibody staining to compare seven groups of viruses, and Isaacs discusses intracellular virus-growth. The remainder of the book details the various structures and functions of animal viruses in the context of their classification. For example there are chapters on haemagglutination, virus receptor chemistry, serological variation and genetic interactions. Tumour and insect viruses are studied, as are interference and variation in virulence for different host systems.

The second volume (not reviewed here) deals with plant viruses. These well-produced volumes provide fundamental reading for any virologist, whatever his particular field of study may be.—J. H. Darbyshire.

Alexander, F. (1960). **An introduction to veterinary pharmacology.** pp. viii + 179. Edinburgh (& London): E. & S. Livingstone Ltd. 20s. **2037**

This is pharmacology in a nutshell, written for veterinary students by the Reader in Veterinary Pharmacology in the University of Edinburgh. It does not contain enough detail to serve as a reference book, but the descriptions of drugs in current use or recently introduced will help to refresh the knowledge of those who qualified long ago. It is quite right that drugs should be described throughout by their pharmacopoeial or approved names, and nothing would be more confusing than to present the student with masses of proprietary names, but there are a few instances where the proper names are only known by a few. Such instances are quinapyramine, chlortetracycline, oxytetracycline and chlorocresol. Here it would help if these names were linked to those commonly if incorrectly used: Antrycide, Aureomycin. Terramycin and Dettol. Students will welcome this concise and lucid work.—R.M.

Seiden, R. (1960). **Veterinary drugs in current use.** pp. 128. New York: Springer Publishing Company, Inc. $2.25. **2038**

A pocket-book of about 600 drugs used in veterinary medicine, listed alphabetically under their approved names, with cross-references from proprietary names. Under each entry there are notes on action, uses,

dosage, toxicity. There are also entries under the names of common diseases which list the drugs used in treatment. The book is designed mainly for pharmaceutical chemists.—R.M.

Pool, W. A. [Edited by.] (1959). **The veterinary annual.** pp. xxiv + 363. Bristol: John Wright & Sons Ltd. (Toronto: The Macmillan Co. of Canada Ltd. Baltimore: The Williams & Wilkins Co.) 42s. **2039**

There has been a Medical Annual since 1883 and now for the first time its veterinary counterpart has appeared. In the words of the editor, "The Veterinary Annual is designed primarily to give essential information about current progress on the wide range of subjects that is dealt with by the veterinary practitioner and the large class which may roughly be spoken of as 'field workers'. The specialized research worker is provided with an elaborate library service . . . but it is hoped that he too may find the Annual a useful source of quick and ready reference."

The Annual commences with 12 contributed articles on current trends in veterinary affairs in the United Kingdom, Canada, Africa, South Africa, New Zealand, Sweden and Denmark which are very interesting. These are followed by a review of literature published during 1958, which forms the bulk of the book and is the work of 43 contributors. All aspects of veterinary work and all the main diseases are covered and there is a detailed subject index. Additional features are lists of new drugs and new books. There are 36 plates and the printing and binding are of good quality. The present volume and the future annual issues can be recommended to all veterinary surgeons.—R.M.

Brandly, C. A., Jungherr, E. L. [Edited by.] (1959). **Advances in veterinary science. Vol. 5.** pp. xi + 450. New York (& London): Academic Press Inc. $14.00. **2040**

The 5th volume of this now well-known publication contains seven extensive reviews on the following subjects:— Examination of the eye and eye operations in animals, by O. Überreiter; Q fever, by B. Babudieri; Rabies, by E. S. Tierkel; Eradication of the tsetse fly from Zululand, by R. M. Du Toit; Theilerioses, by W. O. Neitz; Infectious bovine rhinotracheitis by D. G. McKercher; Tissue culture in veterinary research, by S. H. Madin.

—R.M.

Hoffmann, G. (1959). Histologischer Kurs. Kurze Einführung in die Histologie und mikroskopische Anatomie der Haus- und Laboratoriumstiere. Teil I. Technik, Zellen- und Gewebelehre, allgemeiner Organaufbau. **[Histology of domestic and laboratory animals. Part I. Technique and general morphology.]** pp. x + 159. Jena: Gustav Fischer. DM 24. **2041**

This histological course for veterinary students is to be published in two parts. The first part deals with the techniques of histology and microscopy and the structure of the basic body tissues. We are not told what part 2 will contain but presumably this will deal with the histology of organs. Although histological technique has been described in greater detail in another German book by Pallaske & Schmidel [see *V.B.* **29,** 2724], the methods described in the present work are probably all that a student needs.

The chapters on cells, tissues and the general structure of organs present basic information in a lucid manner and are very well illustrated, with some coloured illustrations.

This book is essentially a practical guide and does not attempt to present the wealth of histological detail given in the textbook of Krölling & Grau [*V.B.* **30,** 1279].—R.M.

Pallaske, G. (1960). Pathologische Histologie. Leitfaden der Histopathologie für Studierende der Vet.-Medizin und Tierärzte. **[Veterinary histopathology.]** pp. xxii + 457. Jena: Gustav Fischer. 2nd Edit. DM 49. **2042**

This excellent book is the only one on veterinary histopathology in existence. Since the first edition in 1955 it has been enlarged by 93 pages, 111 new illustrations have been added (bringing the total to 546) and the quality of the paper is much better, yet the price remains unchanged at an equivalent of about £4. The literature has been covered up to about the middle of 1959. Between editions a French translation has been published by Vigot Frères in Paris in 1958 but regrettably there is no sign of an English translation. A big gap in English veterinary literature remains unfilled.

Recently the author, with E. Schmidel, published another book on histopathological technique [see *V.B.* **29,** 2724] which is complementary to the present volume.—R.M.

Thornton, H. (1960). **The inspection of food. A handbook for students of public health, agriculture and meat technology.** pp. 213. London: Baillière, Tindall & Cox. 2nd Edit. 15s. **2043**

Most readers will be familiar with the

author's Textbook of meat inspection [see *V.B.* **27,** 3797]. This smaller handbook presents meat inspection and also the inspection of other foods (milk, fish, vegetables etc.) in simplified form to suit the student. The main changes compared with the first edition of 1952 concern revision of United Kingdom legislation to bring the book up to date.—R.M.

Villee, C. A. [Edited by.] (1959). **Gestation. Transactions of the fifth conference, March 11, 12, and 13, 1958, Princeton, N.J. [Sponsored by the Josiah Macy, Jr. Foundation.]** pp. 262. New York: Josiah Macy, Jr. Foundation. $5.75. **2044**

These transactions give the text of four papers and the detailed discussion of them. The papers were: Biology of the placenta, by E. C. Amoroso; Genetic factors in prolonged gestation in Holstein-Friesian cattle, by L. W. Holm; Circulation in the placenta, by E. M. Ramsey; Venous drainage from the uterus, by J. Bieniarz. There are 114 illustrations and a subject index.—R.M.

Ruthe, H. (1959). Der Huf. Lehrbuch für den Hufbeschlagschmied. **[The hoof. Textbook for farriers and veterinary students.]** pp. xi + 198. Jena: Gustav Fischer. DM 17.25. **2045**

Chapters on the anatomy of the horse, particularly the foot, are followed by chapters on equipment, tools and materials used by farriers. The main part of the book deals with the methods of normal and surgical shoeing and the diseases of foot and limbs. German legislation in respect of shoeing, including liability, is dealt with. There is an appendix on shoeing and foot-care in cattle. This well produced and illustrated work should be of great value to German farriers and veterinary students.—E.G.

BOOKS RECEIVED

[Notice of recently received books in this list does not preclude review]

Austin, C. R. (Edited by) (1959). **Sex differentiation and development. Proceedings of a Symposium held at the Royal Society of Medicine, Wimpole Street, London, on 10 and 11 April 1958.** pp. x + 198. Cambridge: University Press. [Memoirs of the Society for Endocrinology No. 7.] 45s.

Burnet, F. M. (1960). **Principles of animal virology.** pp. ix + 490. New York (& London): Academic Press. 2nd edit. $12.00.

Christoph, H.-J. (1960). Abriss der Klinik der Hundekrankheiten. **[Diseases of dogs.]** pp. xv + 456. Jena: Gustav Fischer. DM 45.90.

Clayton, K. J. (1960). **Livestock insurance.** pp. v + 132. Stone & Cox, Ltd. 15s.

Daykin, P. W. (1960). **Veterinary applied pharmacology and therapeutics: formerly Hoare's veterinary materia medica and therapeutics.** pp. vii + 767. London: Baillière, Tindall & Cox. 55s.

Gilman, J. C. (1959). **A manual of soil fungi.** pp. x + 450. London: Constable & Co. Ltd. 2nd revised edit. 65s.

Jacquot, R., Le Bars, H. & Simonnet, H. (1960). Nutrition animale: biologie, physiologie et alimentation rationnelle. Volume II, Tome I. Données générales sur la nutrition et l'alimentation. **[Animal nutrition, Volume II, Part I.]** pp. xi + 473-963. Paris: Baillière et Fils. Fr. 5000. (N. Fr. 50).

Newell, F. W. (Edited by) (1960). **Glaucoma. Transactions of the fourth conference, March 8, 9, and 10, 1959, Princeton, N.J. [Sponsored by the Josiah Macy, Jr. Foundation.]** pp. 257. New York: Josiah Macy, Jr. Foundation. $8.00.

Schwarze, E. (1960). Kompendium der Veterinär-Anatomie. Band I. Einführung in die Veterinär - Anatomie. Bewegungsapparat. **[Compendium of veterinary anatomy. Volume I. Bones, joints and muscles.]** pp. xii + 322. Jena: Gustav Fischer. DM 24.80.

Shuttleworth, A. C. & Smythe, R. H. (1960). **Clinical veterinary surgery. Vol. 2. Operative procedure.** pp. viii + 398. London: Crosby Lockwood & Son Ltd. 42s.

Stecher, P. G. (Edited by) (1960). **The Merck index of chemicals and drugs: an encyclopedia for chemists, pharmacists, physicians and members of allied professions.** pp. xi + 1641. Rahway, N.J.: Merck & Co., Inc. 7th edit. $12.00.

Stevenson, J. H. F. (1959). **Mink in Britain.** pp. 144. Exeter: Pitt's Bookshop. 3rd revised edit.

Welch, H. & Marti-Ibañez, M. D. (Edited by) (1960). **Antibiotics annual 1959-60.** pp. xvii + 1034. New York: Antibiotics, Inc. $15.00.

Whitlock, J. H. (1960). **Diagnosis of veterinary parasitisms.** pp. 236. London: Henry Kimpton. 75s.

Wilson, F. (1960). **A review of the biological control of insects and weeds in Australia and Australian New Guinea.** pp. v + 102. Farnham Royal: Commonwealth Agricultural Bureaux. 25s. [Technical Communication No. 1 of the Commonwealth Institute of Biological Control, Ottawa, Canada.]

Zeissler, J., Krauspe, C. & Rassfeld-Sternberg, L. (1960). Die Gasödeme des Menschen. Band II. Pathologie, pathologische Anatomie und Histologie, Pathogenese, Diagnose und Therapie, Literatur. [**Clostridial infections of human beings. Volume II. Pathology, histology, pathogenesis, diagnosis and treatment.**] pp. vii + 373. Darmstadt: Dr. Dietrich Steinkopff Verlag. DM 18.

—. (1960). **New and nonofficial drugs, an annual compilation of available information on drugs, including their therapeutic, prophylactic and diagnostic status, as evaluated by the Council on Drugs of the American Medical Association, 1960.** pp. xxviii + 768. Philadelphia (& Montreal) J. B. Lippincott Co. [London: Pitman Medical Publishing Co. Ltd.] 30s.

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PRESTON, AITKEN, MacLEOD, McDIARMID and ROSEN. An initial investigation on the effects of low level feeding of hydroxyzine dihydrochloride on growth, endocrines and carcass measurements of fattening cattle.

PRESTON, RATTRAY and WHITE. Effects of feeding formalin-treated skim milk to calves.

HODGES and O'CONNOR. An investigation into self-feed silage practices.

CRICHTON, AITKEN and BOYNE. The effect of plane of nutrition during rearing on growth, production, reproduction and health of dairy cattle. II. Growth to maturity.

KING and ROBERTS. Carcass length in the bacon pig; its association with vertebrae numbers and prediction from radiographs of the young pig.

WATSON. Milk yield and butterfat percentage of twin and single-born cattle under experimental and field conditions.

DASSAT and SARTORE. A note on the effect of inbreeding on lamb weights of Sardinian sheep.

BURGESS and LAMMING. The effect of hormones on growth rate and carcass quality of fattening lambs and hoggets.

BURGESS and LAMMING. The effect of diethylstilboestrol, hexoestrol and testosterone on the growth rate and carcass quality of fattening beef steers.

Proceedings of the 31st Meeting of the British Society of Animal Production, Devon, 21-25 September, 1959.

This journal is a continuation and expansion of THE PROCEEDINGS OF THE BRITISH SOCIETY OF ANIMAL PRODUCTION (1951-8) and appears twice a year in March and September.

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The current volume is Volume 30 (Jan., April, July, Oct., 1960). Price 126s. (U.S.A. $19.00.)

Back numbers of most volumes are available. Subscriptions should be sent to The Secretary, Nutrition Abstracts and Reviews, Rowett Research Institute, Bucksburn, Aberdeen, Scotland.

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ERRATA

V.B. **30**, abst. 1053. (1) In line 1, for "10 goats" read: 12 goats. (2) The third sentence should be amended to read: Three subsequent passages, using brain suspensions from scrapie affected goats, produced scrapie in all 38 inoculated goats, whereas only 8 of 20 South Scotland Cheviot sheep inoculated with first-passage goat brain material developed scrapie.

ABBREVIATIONS OF NAMES OF PUBLICATIONS

The abbreviations used in *Index Veterinarius* and *The Veterinary Bulletin* are those of the *World List of Scientific Periodicals published in the years* 1900-1950, 3rd Edit. (1952), London: Butterworths Scientific Publications.

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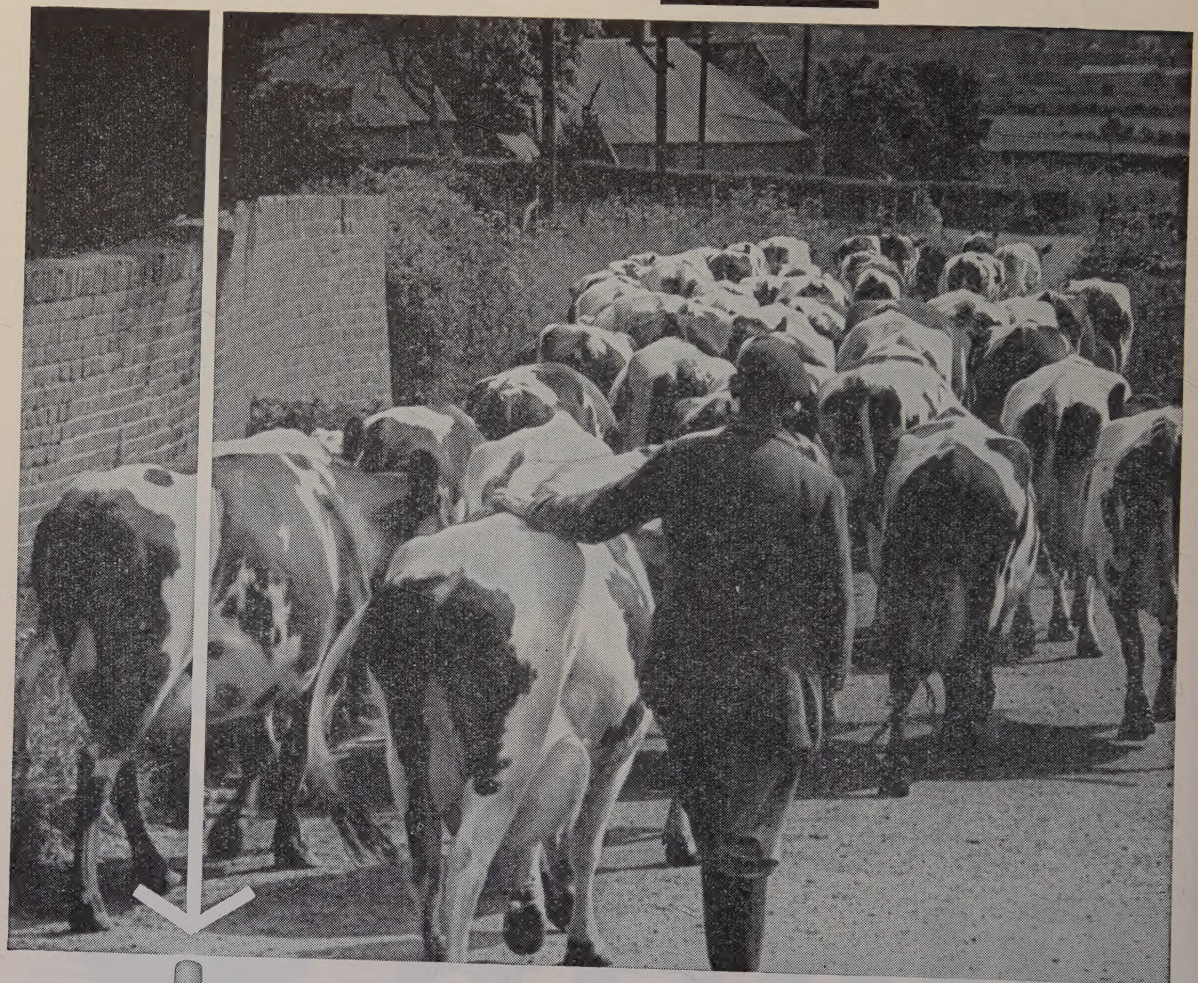

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